

## RESEARCH ARTICLE

# Consumer behavioral intention toward sustainable biscuits: An extension of the theory of planned behavior with product familiarity and perceived value

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## Abstract

Sustainable food consumption may help mitigate the impact that the food industry exerts on the natural environment. To foster sustainable food consumption, it is essential to understand consumers' perceptions related to sustainable food as well as the determinants of the intention to purchase sustainable food. Through an extension of the theory of planned behavior (TPB) with product familiarity (direct and indirect experience) and perceived value (perceived quality and green perceived utility), this study examines the drivers of purchase intention of sustainable biscuits. A survey of 2396 Italian consumers was conducted and structural equation modeling was used to test the developed model. Results show that perceived quality and environmental concern have positive and significant effects on purchase intention, regardless of the specific characteristics of sustainable biscuits, whereas mixed results are obtained about the effect of direct experience and perceived consumer effectiveness. Indirect experience, green perceived utility, perceived behavioral control, and subjective norms do not display any significant effect.

## KEYWORDS

circular economy, green products, green purchase, sustainable consumer behavior, sustainable food, theory of planned behavior

## 1 | INTRODUCTION

The introduction is developed in two sections. Section 1.1 introduces the concept of sustainable food consumption. Section 1.2 presents the aim of this manuscript.

**Abbreviations:** DE, direct experience; EC, environmental concern; GPU, green perceived utility; IE, indirect experience; PCB, perceived behavioral control; PCE, perceived consumer effectiveness; PI, purchase intention; PQ, perceived quality; SN, subjective norms.

### 1.1 | Sustainable food consumption

Nowadays, feeding more than eight billion people is generating significant environmental impacts on natural ecosystems (Benton et al., 2021; FAO, 2017). The food supply chain at the world level is responsible for 26% of the anthropogenic greenhouse gas emissions, 32% of terrestrial acidification, and 78% of eutrophication (Poore & Nemecek, 2018). As a result, food production and consumption activities are contributing to reducing biodiversity and ecological resilience

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(Bouwman et al., 2002; Gong et al., 2023). In the last few decades, many papers addressing “sustainable food consumption” have been published and several definitions of sustainable food are reported in the literature (Verain et al., 2012). According to the UK Sustainable Development Commission (2005, 2009), sustainable food is defined as food that “is safe, healthy, and nutritious for consumers in shops, restaurants, schools, hospitals, and so forth; can meet the needs of the less well off at a global scale; provides a viable livelihood for farmers, processors, and retailers whose employees enjoy a safe and hygienic working environment; respects biophysical and environmental limits in its production and processing while reducing energy consumption and improving the wider environment; respects the highest standards of animal health and welfare compatible with the production of affordable food for all sectors of society; and supports rural economies and the diversity of rural culture, in particular by emphasizing local products that minimize food miles” (Reisch et al., 2017, p. 8). The concept of sustainable food consumption considers, thus, the impacts played on the environment, humans (e.g., healthy and nutritional issues), animal welfare, and the overall society (e.g., fair trade), simultaneously (Masset et al., 2014).

Within this research field, several contributions have been focused on investigating the consumers' preferences and attitude toward purchasing and consuming sustainable food (Li & Kallas, 2021), in particular food produced with a commitment to environmental sustainability—that is, organically produced (Akgüngör et al., 2010; Denver & Jensen, 2014; Díaz et al., 2012; Ogebeide et al., 2014; Sadiq et al., 2022; Van Loo et al., 2011), produced with environmentally friendly practices (Aye et al., 2019; Loureiro, 2003), eco-labeled (Galati et al., 2019; Loureiro & Hine, 2002; Salladarré et al., 2016; Siraj et al., 2022; Van Loo et al., 2014; Xu et al., 2012), and locally produced (De-Magistris & Gracia, 2016; Loureiro & Hine, 2002)—and produced or marketed with commitment to social responsibility, that is, produced in lands confiscated from criminal organizations or employing part of the proceeds to combat AIDS (Vecchio, 2013), welfare-labeled (Drichoutis et al., 2017; Miranda-de la Lama et al., 2017; Olesen et al., 2010; Solgaard & Yang, 2011), and fair trade (De Pelsmacker et al., 2005). With regard to product categories, studies have been conducted on several food products (De Pelsmacker et al., 2005), such as fruit and vegetables (Aye et al., 2019), wine (Forbes et al., 2009; Sellers-Rubio & Nicolau-Gonzalbez, 2016), chocolate (Vecchio & Annunziata, 2015), seafood products (Zander & Feucht, 2017), meat products (Tait et al., 2016; Vanhonacker et al., 2013), coffee (De Pelsmacker et al., 2005; Van Loo et al., 2015), dairy products (Napolitano et al., 2010), eggs (Güney & Giraldo, 2020), and beer (Carley & Yahng, 2018).

## 1.2 | Aim of the paper

This paper contributes to the research stream on consumer behavior related to sustainable food, by investigating the consumers' purchase intention for sustainable biscuits. Indeed, to the best of our

knowledge, very limited efforts have been addressed to study consumers' attitude toward sustainable biscuits so far; specifically, the attention has been focused on the willingness to pay for biscuits made with upcycled ingredients and on profiling consumers based on their attitude toward palm oil issue in biscuits (Baldassarre et al., 2023; Grasso & Asioli, 2020). Nevertheless, consumer behavior toward sustainable biscuits is worthy of investigation, due to the size of the environmental impact due to these products.

Within the confectionery sector, biscuits constitute an important segment both in developed and developing countries (Manley, 2001). In 2022, the global biscuits market size was valued at 101.15 billion dollars and it is expected to growth up to 150 billion dollars up to 2030.<sup>1</sup> From a quantitative perspective, the European biscuit consumption is forecast to reach 11 billion kilograms in 2026.<sup>2</sup>

From the environmental perspective, the impact generated by the biscuits supply chain is not negligible. According to Konstantas et al. (2019), consuming 1 kg of biscuits at home contributes to generating up to 1.8 kg of CO<sub>2</sub> equivalent and to using up to 2000 L of water. The study by Miah et al. (2018) highlights that up to 6.7 kg of CO<sub>2</sub> equivalent can be produced and 1500 L of water can be used per kilogram of biscuits consumed. Similar results are also found by Noya et al. (2018). The abovementioned studies also highlight that raw materials production is the phase mostly responsible for the environmental impacts, followed by manufacturing processes, transportation processes, and product packaging. Hence, reducing the environmental impact of the biscuits sector is of great importance nowadays. One way to achieve this goal is favoring the production and consumption of “sustainable biscuits.”

This paper is aimed at shedding light on the phenomenon of sustainable consumption related to biscuits by investigating which factors influence the consumers' purchase intention of sustainable biscuits. As theoretical basis, this study relies on the theory of planned behavior (Ajzen, 1985), extended with product familiarity and perceived value by consumers.

This research is focused on Italian consumers. The Italian setting is particularly interesting to understand consumer behavior regarding sustainable biscuits. Indeed, the annual revenue of the Italian biscuits industry is close to five billion euros (Statista, 2021); furthermore, 40% of Italian consumers eat biscuits for breakfast<sup>3</sup> and the annual per capita consumption of biscuits is equal to 10.5 kg (Statista, 2016). In particular, through a survey conducted on Italian consumers, this paper investigates the consumer behavior toward four types of sustainable biscuits: (1) biscuits made with organic ingredients, that is, sourced from sustainable agriculture (Pretty, 2007; Wezel et al., 2014); (2) biscuits made with natural ingredients, that is, without colorings or preservatives, substances that can have negative impacts on human health (Novais et al., 2022); (3) biscuits without palm oil, which is recognized being source of negative environmental impacts

<sup>1</sup><https://www.fortunebusinessinsights.com/biscuits-market-108482>.

<sup>2</sup><https://www.reportlinker.com/clp/global/2346>.

<sup>3</sup>[https://www.repubblica.it/economia/rapporti/osserva-italia/conad/2019/10/14/news/biscotti\\_e\\_cereali\\_e\\_dolce\\_la\\_colazione\\_degli\\_italiani-238505177/](https://www.repubblica.it/economia/rapporti/osserva-italia/conad/2019/10/14/news/biscotti_e_cereali_e_dolce_la_colazione_degli_italiani-238505177/) (last accessed on November 15, 2023).

(Fitzherbert et al., 2008); and (4) biscuits made with Italian ingredients—local supply chains reduce the negative environmental impacts of transportation<sup>4</sup> (Noya et al., 2018; Roibás et al., 2018).

The paper is organized as follows. Section 2 presents the theoretical background and research hypotheses. Section 3 presents the research methodology. Sections 4 and 5 are devoted to results and discussion, respectively. Finally, Section 6 presents the implications, future research directions, and conclusions.

## 2 | THEORETICAL BACKGROUND AND RESEARCH HYPOTHESES

### 2.1 | Theoretical background

During the past few years, a growing number of studies investigated green or sustainable consumer behavior and its determinants (Ashfaq et al., 2022; Chaihananchai & Anantachart, 2023; Chen et al., 2022; Dangelico et al., 2021, 2022; Galati et al., 2022; Koenig-Lewis et al., 2022; Pretner et al., 2021; Riva et al., 2022; Testa et al., 2021; Xu et al., 2020; Zaremohzzabieh et al., 2021). Sustainable consumer behavior can be defined as “behavior that attempts to satisfy present needs while simultaneously benefiting or limiting environmental impact” (Trudel, 2019, p. 85).

The theory of planned behavior (TPB) (Ajzen, 1985) is one of the most commonly used theoretical lenses to investigate the phenomenon of sustainable consumer behavior (Alzubaidi et al., 2021; Dangelico et al., 2021; Oehman et al., 2022; Sheoran & Kumar, 2021; Yadav & Pathak, 2017). The TPB posits that behavioral intention is shaped by the interplay of one's attitude toward the behavior, subjective norm, and perceived behavioral control. Several extensions/adaptations of the TPB have been proposed so far to explain sustainable consumer behavior. For instance, Yadav and Pathak (2017) extended the TPB by including perceived value and willingness to pay a premium price as determinants of behavioral intention. Alzubaidi et al. (2021) added materialism and innovativeness as antecedents of behavioral intentions, while Dangelico et al. (2021) included materialism, innovativeness, creativity, green practices, product functional value, and value-for-money to explain the frequency of purchase of green products and the willingness to pay a premium price for these products.

As common in sustainable consumer behavior studies (e.g., Alzubaidi et al., 2021; Dangelico et al., 2021; Fransson & Gärling, 1999), in this study, environmental concern is used as a representation of attitude. Further, perceived consumer effectiveness, which in some studies on sustainable consumer behavior replaces perceived behavioral control (e.g., Alzubaidi et al., 2021), is added to the three classic TPB variables. This choice is made in consideration of the significant role played by individuals' perception that their behavior can contribute to addressing environmental issues. This perception influences their intentions to engage in pro-environmental behaviors

and make environmentally conscious purchases (Alzubaidi et al., 2021; Gleim et al., 2013; Roberts, 1996).

This study extends the TPB by integrating it with product familiarity and perceived value. This extension is believed as relevant since product familiarity and perceived value have been proven as important determinants of the intention to purchase green products (e.g., Dangelico et al., 2022; Yadav & Pathak, 2017). Perceived value was included in this study as made of two components: product quality (Chou et al., 2020) and green utility (Chang, 2011; Magnier et al., 2019).

### 2.2 | Research hypotheses

#### 2.2.1 | Product familiarity

Product familiarity has been defined as “cognitive structures of knowledge concerning the product stored in memory” (Marks & Olson, 1981, p. 145). The familiarity with the product depends on the previous product-related experience and has a crucial role in influencing product learning and evaluation (Alba et al., 1987; Marks & Olson, 1981; van Kleef et al., 2005). Product familiarity includes both *direct* (e.g., prior purchase or use) and *indirect* (e.g., knowing the product exists) *experiences* that consumers have with that product (Marks & Olson, 1981). Previous research highlighted that product familiarity may positively influence consumers' behavioral intention and purchase decisions (Dangelico et al., 2022; Dewi et al., 2021; Nguyen et al., 2015). Indeed, strong familiarity with a product can undercut a consumer's sense of risk associated with the product (Kim & Kwon, 2018); thus, the consumer feels more certain about buying it (Herrera & Blanco, 2011; Verbeke et al., 2009). Referring to food products, the positive effect of product familiarity on purchase intention has been proven for organic food in general (Smith & Paladino, 2010), safe vegetables (Zhang et al., 2018), and organic rice (Jitrawang & Krairit, 2019), among others.

Hence, it is hypothesized that

**Hypothesis 1a.** Direct experience positively influences the consumer's intention to purchase sustainable biscuits.

**Hypothesis 1b.** Indirect experience positively influences the consumer's intention to purchase sustainable biscuits.

#### 2.2.2 | Perceived quality

Perceived quality is “the customer's perception of the overall quality or superiority of a product or service with respect to its intended purpose, relative to alternatives” (Chou et al., 2020, p. 3). The evaluation of a product's quality represents a subjective judgment made by a consumer regarding the extent to which the product aligns

<sup>4</sup>Italian ingredients have been selected as they are local for Italian consumers.

with their specific requirements, desires, and needs (Alamsyah et al., 2020; Garvin, 1984; Larson, 1994).

Several studies have emphasized the significance of quality in influencing consumers' decisions when purchasing green products (Chou et al., 2020; Mondelaers et al., 2009). Taste, quality, and healthiness of products are important factors influencing a consumer's intention to purchase green food (Cerjak et al., 2010). Previous research found that perceived quality influences the intention to purchase organic food in general (Smith & Paladino, 2010), hydroponic vegetables (Ezni Balqiah et al., 2020), organic meat (Wong & Aini, 2017), upcycled food (Zhang et al., 2021), and organic tea (Sumi & Kabir, 2018), among others.

Hence, it is hypothesized that

**Hypothesis 2.** Perceived quality positively influences the consumer's intention to purchase sustainable biscuits.

### 2.2.3 | Green perceived utility

The concept of green perceived utility pertains to an individual's perception of the usefulness of green products in mitigating environmental threats (Chang, 2011). Previous studies highlighted that when consumers are aware that the environmental impacts of green products are lower than those of traditional products, they give a higher value to green products, *ceteris paribus* (Wang & Hazen, 2016): as a result, their intention to purchase these green products increases (Chen & Chang, 2012; Michaud & Llerena, 2011). This has been proven for green products in general (Ng et al., 2023; Yadav & Pathak, 2017),<sup>5</sup> as well as for specific product categories, such as hybrid vehicles (Kahn, 2007), green furniture (Xu et al., 2020), and green cosmetics and personal care products (Suphasomboon & Vassanadumrongdee, 2022). The positive impact of green perceived utility on purchase intention has also been very recently proven for electronic products deriving from industrial symbiosis (Fraccascia et al., 2023).

Hence, it is hypothesized that

**Hypothesis 3.** Green perceived utility positively influences the consumer's intention to purchase sustainable biscuits.

### 2.2.4 | Environmental concern

Environmental concern reflects consumer's worries about environmental issues and is defined as the degree of importance the consumer associates to environmental problems (Amatulli et al., 2019). Over the years, scholars have referred to environmental concern as

the entire range of environmentally related worries, perceptions, emotions, knowledge, and attitudes (Bamberg, 2003). Environmental concern is considered a critical component influencing pro-environmental behavior and green consumption (Choi & Kim, 2005; Felix et al., 2018; Kilbourne & Pickett, 2008). Indeed, there is evidence in the literature that the more consumers are concerned about the environment, the higher their intention to purchase green products (Dangelico et al., 2022; Yadav & Pathak, 2016). Referring to the food industry, this has been proven for organic products in general (Grunert & Juhl, 1995; Kilbourne & Pickett, 2008; Zayed et al., 2022), organic food (Saleki et al., 2020), vegetarian products with "artificial meat" (Shen & Chen, 2020), and organic tea (Sumi & Kabir, 2018), among others.

Hence, it is hypothesized that

**Hypothesis 4.** Environmental concern positively influences the consumer's intention to purchase sustainable biscuits.

### 2.2.5 | Perceived behavioral control

Perceived behavioral control (PBC) is the "person's perception of the extent to which performing a behavior is under his/her control" (Sheeran et al., 2003, p. 394). PBC refers to the individual perceived ease or difficulty of performing a given behavior, influenced by the consumers' means and opportunities necessary to perform the behavior (Ajzen, 1988; Bamberg, 2003; Yadav & Pathak, 2016). In particular, when consumers exhibit greater self-confidence in executing a specific behavior, their perceived behavioral control is strengthened (Pavlou & Fygenson, 2006). In studies related to the purchasing decision-making process, PBC indicates whether the consumer can easily obtain information on a certain product or buy that product (Albayrak et al., 2013; Hameed et al., 2019). Within the context of green product consumption, perceived behavioral control exerts a positive influence on individuals' willingness to adopt environmentally friendly behaviors and their intention to purchase green products (Arlı et al., 2018; Lavuri, 2022a). Indeed, previous studies proved that PBC positively influences the willingness to buy green products (Wang et al., 2014; Yadav & Pathak, 2016), such as eco-fashion clothes made of recycled materials (Jalil & Shaharuddin, 2019), remanufactured products (Wang et al., 2013), and green skincare products (Hsu et al., 2017), among others. This has also been proven for organic food in general (Saleki et al., 2020; Yadav & Pathak, 2016), organic tomatoes (Dean et al., 2012), organic meat (Stranieri et al., 2023; Wong & Aini, 2017), organic milk (Carfora et al., 2019), organic apples (Dean et al., 2008), and organic vegetables (Dorce et al., 2021).

Hence, it is hypothesized that

**Hypothesis 5.** Perceived behavioral control positively influences the consumer's intention to purchase sustainable biscuits.

<sup>5</sup>In the scale *perceived value*, they refer to environmental performance and benefits of products.

## 2.2.6 | Perceived consumer effectiveness

Perceived consumer effectiveness (PCE) has been first defined as an estimate of how personal consumption behavior can contribute to solving a problem (Allen, 1982). Lately, the PCE has referred to the belief that individual effort is helpful to solve environmental issues and that every individual can make a difference in solving a specific problem (Ellen et al., 1991): Accordingly, the more the consumer believes that his/her behavior can contribute to the environment, the higher his/her perceived consumer effectiveness will be, *ceteris paribus*. PCE can significantly influence the consumer's intention to adopt pro-environmental behaviors and green consumption (Alzubaidi et al., 2021; Ellen et al., 1991; Gleim et al., 2013; Lavuri, 2022b). Consequently, consumers thinking their behavior can contribute to mitigating environmental problems are more likely to purchase green products (Choi & Kim, 2005; Jaiswal & Kant, 2018; Kamboj & Matharu, 2021; Sharma & Foropon, 2019), such as environmentally sustainable textiles and apparel (Kang et al., 2013), as well as secondhand or upcycled fashion products (Park & Lin, 2020). This has been also proven for several food products, including sustainable dairy products (Vermeir & Verbeke, 2008), organic meat (Verhoef, 2005), and green chicken (Minbashrazgah et al., 2017).

Hence, it is hypothesized that

**Hypothesis 6.** Perceived consumer effectiveness positively influences the consumer's intention to purchase sustainable biscuits.

## 2.2.7 | Subjective norms

Subjective norms indicate the “perceived social pressure to perform or not to perform the behavior” (Ajzen, 1991, p. 188). Subjective norms are a fundamental factor affecting consumers' choices and decision-making (Biswas & Roy, 2015; Sheth et al., 1991).

Indeed, the likelihood of engaging in a specific behavior is shaped by the approval or disapproval of others regarding that behavior, and this influence can significantly affect the formation of consumer values (Conner & Armitage, 1998; Gadenne et al., 2011). Subjective norms are an important predictor of green purchasing behavior. Indeed, several studies highlighted that subjective norms positively affect the consumer's intention to purchase green products (Eze & Ndubisi, 2013; Ozaki, 2011; Yadav & Pathak, 2016), for instance organic cotton apparel (Han & Chung, 2014), eco-fashion clothes made of recycled materials (Jalil & Shaharuddin, 2019), and remanufactured products (Pisitsankhakarn & Vassanadumrongdee, 2020; Wang et al., 2013). In the food setting, the impact of subjective norms has been proven for organic food in general (Saleki et al., 2020), organic tomatoes (Dean et al., 2012), sustainable chocolate (Salazar et al., 2013), organic meat (Wong & Aini, 2017), organic milk (Carfora et al., 2019), organic apples (Dean et al., 2008), organic pizza (Dean et al., 2008), and organic vegetables (Dorce et al., 2021).

Hence, it is hypothesized that

**Hypothesis 7.** Subjective norms positively influence the consumer's intention to purchase sustainable biscuits.

## 2.3 | The theoretical model

Figure 1 shows the theoretical model of consumers' intention to purchase sustainable biscuits. Specifically, the model is structured into three primary categories of determinants on the left side: product familiarity, perceived value, and factors associated with the classic TPB model. On the right side of the figure is the consumer's purchase intention. Finally, as common in consumer behavior studies, consumer's sociodemographic variables that can influence consumer behavior are included in the model.

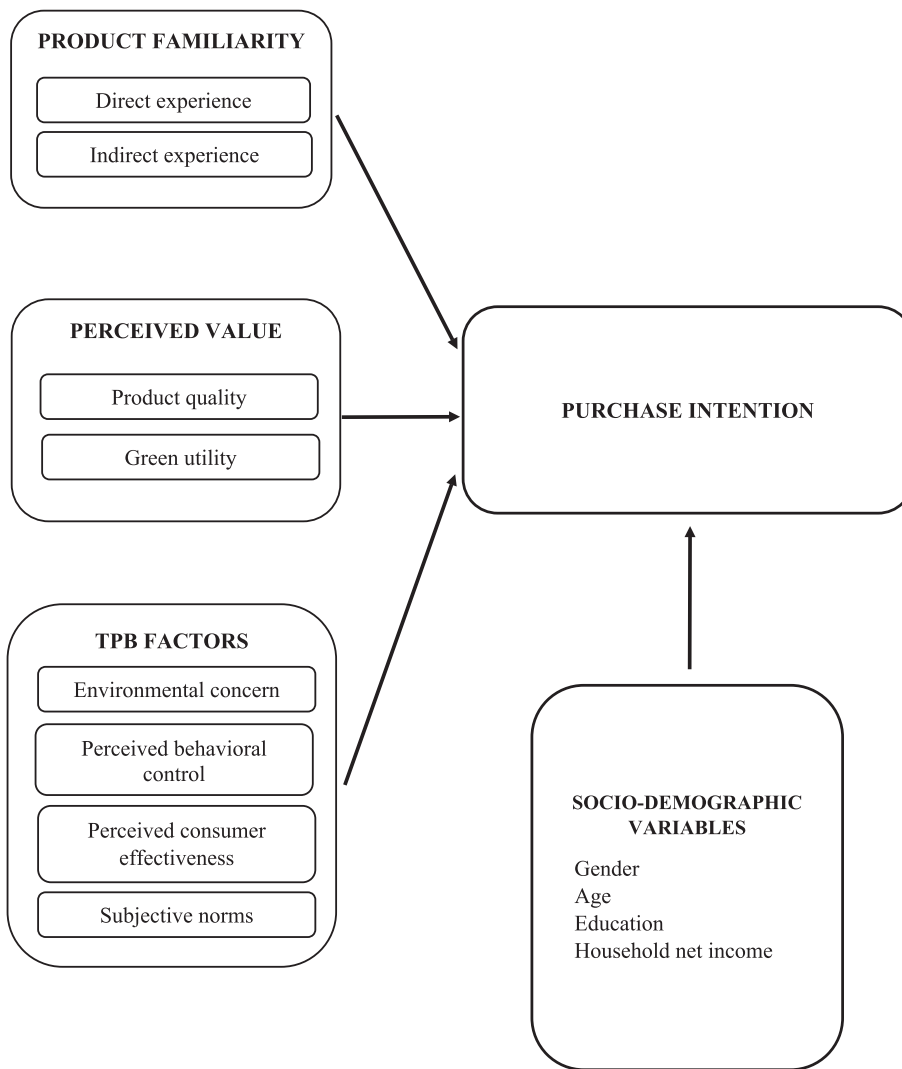
## 3 | RESEARCH METHODOLOGY

The research methodology is divided into three subsections. Section 3.1 refers to data collection and sample, Section 3.2 describes the questionnaire, while Section 3.3 focuses on the analytic technique.

### 3.1 | Data collection and sample

Primary data were collected through a survey addressed to Italian consumers between June 2021 and July 2021. For this purpose, a questionnaire was constructed and subjected to a preliminary test on a limited consumer sample to ensure the clarity of the questions and to assess the time needed for survey completion. The pretest led to small changes in wording. The questionnaire was distributed online through social networks and instant messaging clients, as common in similar studies (e.g., Pivetti et al., 2020; Wei et al., 2021). Although this method can be affected by sampling biases (due to the use of a non-probabilistic sample) and might not guarantee representation, a high number of responses helps to mitigate these risks (Atkinson & Flint, 2001). The final sample of respondents consisted of 2396 consumers. All the questions were mandatory; hence, there are no missing values in the dataset.

The sample is characterized by 38% of male respondents and 62% of female respondents. Respondents are mainly young people: Almost 70% of respondents are younger than 35 years old, while 7% are between 35 and 44 years old, 13% are between 45 and 54 years old, and 13% are over 55 years old. About 70% of respondents have at least a bachelor's degree. Concerning the household net income, 8% of respondents declared an income lower than 1000 euros, 15% between 1000 and 1500 euros, 18% between 1501 and 2000 euros, 14% between 2001 and 2500 euros, 15% between 2501 and 3000 euros, and 29% higher than 3000 euros. Sociodemographic characteristics of the sample are reported in Table 1.



**FIGURE 1** Theoretical model of consumer's intention to purchase sustainable biscuits.

### 3.2 | Questionnaire structure

The questionnaire was made of several questions, aimed at measuring *product familiarity*, *perceived quality*, *green perceived utility*, *environmental concern*, *perceived behavioral control*, *perceived consumer effectiveness*, *subjective norms*, and *purchase intention*. *Product familiarity* was assessed by asking respondents to select which of the following three items better represented their familiarity with sustainable biscuits: (1) "I have purchased these products" (which reflects a *direct experience* with the products), (2) "I have never purchased these products, but I have heard of them" (which reflects an *indirect experience* with the products), and (3) "I have never purchased these products and never heard of them" (which reflects *no previous experience* with the products). The answer was transformed into two binary variables: *direct product familiarity* (coded as 1 for a "yes" answer to the first item, 0 otherwise) and *indirect product familiarity* (coded as 1 for a "yes" answer to the second item, 0 otherwise); a "yes" answer to the third item was coded as a 0 for both *direct* and *indirect product familiarity*. All other constructs were measured through a multi-item 5-point Likert scale ranging from

1 = *Strongly disagree* to 5 = *Strongly agree*. Specifically, *perceived quality* was measured with three items (new scale; items developed based on Hsu et al., 2017), *green perceived utility* with two items (adapted from Chang, 2011; Magnier et al., 2019), *environmental concern* with three items (D'Souza et al., 2015), *perceived behavioral control* with three items (adapted from Kang et al., 2013), and *perceived consumer effectiveness* with three items (Kang et al., 2013); *subjective norms* was measured with three items, using social influence as a proxy (Alzubaidi et al., 2021). *Purchase intention* is assessed through two items (adapted from Magnier et al., 2019; Mugge et al., 2017). All scales are reported in Table A1. *Product familiarity*, *perceived value*, and *purchase intention* have been measured referring to four types of sustainable biscuits with the following specific characteristics: (1) ingredients from organic farming; (2) natural ingredients, without preservatives or dyes; (3) without palm oil; and (4) with Italian ingredients. The survey ended with some questions about sociodemographic characteristics of respondents, as common in this kind of studies (e.g., Alzubaidi et al., 2021; Dangelico et al., 2021, 2022; de Marchi et al., 2020; Magnier et al., 2019): gender (a dummy variable coded as 0 for male and 1 for female), age (from



**TABLE 1** Sociodemographic characteristics of the sample.

	Frequency	Percentage
Gender		
Male	899	38
Female	1497	62
Age		
18–24	1004	42
25–34	586	25
35–44	175	7
45–54	300	13
55–65	272	11
Over 65	59	2
Education		
Middle school or lower	50	2
High school	888	37
Bachelor's degree	733	31
Master's degree	679	28
Doctorate	46	2
Monthly household net income		
Less than 1000 €	191	8
1000–1500 €	368	15
1501–2000 €	441	18
2001–2500 €	336	14
2501–3000 €	363	15
Over 3000 €	697	29

1 = “18–24” to 6 = “over 65”), education (from 1 = “Middle school or lower” to 5 = “Doctorate”), and monthly household net income (from 1 = “less than 1000 €” to 6 = “over 3000 €”).<sup>6</sup>

### 3.3 | Analytic technique

To test our hypotheses, a two-step approach using AMOS 25.0 was conducted. First, the measurement model was assessed and validated through a confirmatory factor analysis (CFA), and then, structural equation modeling (SEM) was employed to test the hypotheses developed in Section 2.1. Similar to Dangelico et al. (2022), analyses were first conducted focusing on biscuits made with organic ingredients; then, as a robustness check, the same models were tested for biscuits made with natural ingredients, biscuits without palm oil, and biscuits made with Italian ingredients.

Due to the large size of the sample and the sensitivity of the chi-square ( $\chi^2$ ) statistic to sample size, several other indexes were employed to evaluate the overall model fit (Bagozzi & Yi, 1988; Byrne, 2001; Kline, 2015): adjusted goodness-of-fit index (AGFI),

comparative fit index (CFI), Tucker and Lewins index (TLI), standardized root mean square residual (SRMR), and root mean square error of approximation (RMSEA).

## 4 | RESULTS

Results are described in the following four subsections: descriptive analysis (Section 4.1), the measurement model (Section 4.2), the structural model (Section 4.3), and the robustness check (Section 4.4).

### 4.1 | Descriptive analysis

Table A1 shows all the scales' details (items, items' mean, items' standard deviation, and Cronbach's  $\alpha$ /Spearman–Brown's coefficient).

For scales referring to the different characteristics of sustainable biscuits, the distributions of responses are reported. With regard to product familiarity (Table A2), a very limited number of respondents declared a direct experience (i.e., to have previously bought) with sustainable biscuits (less than 5% for all types of biscuits). A greater level of variability among responses for the different types of ingredients can be noticed for indirect experience (i.e., having heard of them), with the highest percentage of respondents having an indirect experience with organic ingredients (about 25%) and the lowest with biscuits without palm oil (about 8%). As a result, the lowest percentage of respondents having no experience is referred to organic products (about 70%), indicating that, among the four characteristics, the use of organic ingredients is the most known by consumers; alternatively, the avoidance in the use of palm oil is the least known (about 90% of respondents have no experience).

The distribution of responses related to *perceived quality*, *green perceived utility*, and *purchase intention* for the different types of sustainable biscuits (from 1 = *strongly disagree* to 5 = *strongly agree*) is displayed in Table A3. With regard to *perceived quality*, compared with conventional biscuits, most of the respondents believe that general quality is higher for all types of sustainable biscuits (the percentage of respondents agreeing or strongly agreeing ranges from about 69% [without palm oil] to about 86% [natural ingredients]); in terms of taste, most of the respondents believe that it is better than that of conventional biscuits (the percentage of respondents agreeing or strongly agreeing ranges from about 51% [without palm oil] to about 65% [natural ingredients]); and in terms of healthiness, most of the respondents believe that it is higher than conventional biscuits (the percentage of respondents agreeing or strongly agreeing ranges from about 64% [Italian ingredients] to 91% [natural ingredients]). With regard to *green perceived utility*, most respondents believe that these products are good for the environment and reduce pollution, with the highest percentages for biscuits made of organic ingredients. Referring to purchase intention, most respondents declared intention to buy sustainable biscuits, with the greatest percentages referring to biscuits made with natural ingredients.

<sup>6</sup>Other questions, out of the scope of this paper, were included in the questionnaire.

**TABLE 2** Summary of the measurement model (biscuits made with organic ingredients).

Construct	Item #	Stand. factor loading	CR	Discriminant validity							
Perceived quality (PQ)	1	0.874	0.885	Squared construct correlations off-diagonal; AVE on diagonal (bold)							
	2	0.832		Constructs	PQ	GPU	EC	PBC	PCE	SN	PI
	3	0.839		PQ	<b>.720</b>						
Green perceived utility (GPU)	1	0.919	0.916	GPU	.318	<b>.845</b>					
	2	0.919		EC	.103	.125	<b>.790</b>				
Environmental concern (EC)	1	0.903	0.919	PBC	.008	.004	.007	<b>.743</b>			
	2	0.907		PCE	.127	.162	.391	.003	<b>.841</b>		
	3	0.857		SN	.066	.065	.103	.007	.105	<b>.870</b>	
Perceived behavioral control (PBC)	1	0.861	0.956	PI	.318	.213	.140	.003	.150	.048	<b>.825</b>
	2	0.874									
	3	0.852									
Perceived consumer effectiveness (PCE)	1	0.918	0.941								
	2	0.916									
	3	0.918									
Subjective norms (SN)	1	0.921	0.953								
	2	0.944									
	3	0.933									
Purchase intention (PI)	1	0.908	0.904								
	2	0.908									

Note:  $N = 2396$ ; model fit ( $\chi^2 = 531.154$  [df = 131] [ $p = .000$ ], CFI = 0.985, AGFI = 0.965, TLI = 0.981, RMSEA = 0.036, SRMR = 0.024). Abbreviation: AVE, average variance extracted.

## 4.2 | The measurement model

A confirmatory factor analysis (CFA) was performed to test the measurement model. The model is made of seven factors: *perceived quality*, *green perceived utility*, *perceived behavioral control*, *perceived consumer effectiveness*, *environmental concern*, *subjective norms*, and *purchase intention*.

The fit indices show a good model fit ( $\chi^2 = 531.154$  [df = 131] [ $p = .000$ ],<sup>7</sup> CFI = 0.985, AGFI = 0.965, TLI = 0.981, RMSEA = 0.036, SRMR = 0.024) (Byrne, 2001; Hair et al., 2006).

Constructs' convergent validity and reliability were evaluated through average variance extracted (AVE), Cronbach's alpha and Spearman-Brown's coefficient (used for the two-item scales: green perceived utility and purchase intention, according to Eisinga et al., 2013), and composite reliability (CR). All factor loadings exceed the value of 0.50; all factors have a Cronbach's alpha/Spearman-Brown's coefficient exceeding the value of .70, as well as CR and AVE are above the cut-off values of 0.70 and 0.50, respectively; thus, all constructs reached the minimum threshold for a good convergent validity and reliability (Hair et al., 2006; Nunnally & Bernstein, 1994) (see Tables 2 and A1).

To study the discriminant validity, the Fornell and Larcker (1981) criterion was applied. Table 2 displays the correlation matrix and the AVE of each construct. It can be noticed that discriminant validity is proved for all constructs, since the AVE is higher than the squared correlation coefficient between each construct and other constructs (Hair et al., 2006).

## 4.3 | The structural model

To test the structural model, product familiarity (direct and indirect experience) and the control variables (sociodemographic variables) were added to the measurement model; the hypothesized paths were included as well. Model fit indices indicated a good model fit ( $\chi^2 = 799.063$  [df = 203] [ $p = .000$ ], CFI = 0.981, AGFI = 0.956, NFI = 0.975, TLI = 0.973, RMSEA = 0.035, SRMR = 0.021) (Byrne, 2001; Hair et al., 2006).

Table 3 shows the results of the structural model. In line with Hypotheses 1a, 2, and 5, results show that direct experience, perceived quality, and environmental concern have a positive and significant effect on purchase intention. Alternatively, indirect experience, green perceived utility, perceived behavioral control, perceived consumer effectiveness, and subjective norms do not influence the intention to purchase biscuits made with organic ingredients. Thus, Hypotheses 1b, 3, 4, 6, and 7 are not supported.

<sup>7</sup>The  $\chi^2$  test, being sensitive to sample size, almost always provides significant results when large samples are used (Iacobucci, 2009; Testa et al., 2020).



**TABLE 3** Structural equation model coefficients (biscuits made with organic ingredients).

Paths	Standardized coefficients
PQ → PI	0.622**
GPU → PI	0.015
EC → PI	0.182**
PBC → PI	0.015
PCE → PI	0.040
SN → PI	−0.030
IE → PI	−0.031
DE → PI	0.161**
Control variables	
Gender → PI	0.017
Age → PI	−0.043*
Education → PI	0.000
Income → PI	0.016

Note:  $N = 2396$ ; model fit ( $\chi^2 = 799.063$  [df = 203] [ $p = .000$ ], CFI = 0.981, AGFI = 0.956, NFI = 0.975, TLI = 0.973, RMSEA = 0.035, SRMR = 0.021).

Abbreviations: DE, direct experience; EC, environmental concern; GPU, green perceived utility; IE, indirect experience; PCB, perceived behavioral control; PCE, perceived consumer effectiveness; PI, purchase intention; PQ, perceived quality; SN, subjective norms.

\* $p < .05$ , and \*\* $p < .01$ .

Referring to sociodemographic variables, results show that age has a negative and significant impact on purchase intention, meaning that younger consumers have a higher intention to purchase biscuits made with organic ingredients.

#### 4.4 | Robustness check

To test the robustness of the obtained results, the same measurement and structural models were employed to study the intention to purchase biscuits made with natural ingredients, biscuits made without palm oil, and biscuits made with Italian ingredients.

The measurement models showed a satisfactory model fit, with good convergent validity, reliability, and discriminant validity (Tables 4, 5, 6, and A1). Moreover, the structural model indicated a good model fit for all types of sustainable biscuits (Tables 7, 8, and 9).

Perceived quality and environmental concern have been proven to be strong predictors of purchase intention for all the four types of sustainable biscuits. Thus, Hypotheses 2 and 4 are fully supported (as shown in Table 10). Alternatively, the results referring to the effect of direct experience on purchase intention are mixed, as direct experience positively influences purchase intention for three out of four types of biscuits. Thus, results referred to Hypothesis 1a are mixed. Different from what was found for biscuits made with organic

**TABLE 4** Summary of the measurement model (biscuits made with natural ingredients, without dyes and preservatives).

Construct	Item #	Stand. factor loading	CR	Discriminant validity
Perceived quality (PQ)	1	0.857	0.858	Squared construct correlations off-diagonal; AVE on diagonal (bold)
	2	0.783		Constructs PQ GPU EC PBC PCE SN PI
	3	0.811		PQ <b>.669</b>
Green perceived utility (GPU)	1	0.915	0.916	GPU <b>.220</b> <b>.845</b>
	2	0.915		EC <b>.112</b> <b>.118</b> <b>.790</b>
Environmental concern (EC)	1	0.903	0.919	PBC <b>.006</b> <b>.007</b> <b>.007</b> <b>.743</b>
	2	0.907		PCE <b>.136</b> <b>.138</b> <b>.391</b> <b>.003</b> <b>.841</b>
	3	0.857		SN <b>.054</b> <b>.082</b> <b>.103</b> <b>.007</b> <b>.105</b> <b>.870</b>
Perceived behavioral control (PBC)	1	0.861	0.956	PI <b>.312</b> <b>.150</b> <b>.144</b> <b>.003</b> <b>.147</b> <b>.043</b> <b>.827</b>
	2	0.874		
	3	0.852		
Perceived consumer effectiveness (PCE)	1	0.918	0.941	
	2	0.916		
	3	0.918		
Subjective norms (SN)	1	0.921	0.953	
	2	0.944		
	3	0.933		
Purchase intention (PI)	1	0.909	0.905	
	2	0.909		

Note:  $N = 2396$ ; model fit ( $\chi^2 = 546.857$  [df = 131] [ $p = 0.000$ ], CFI = 0.984, AGFI = 0.964, TLI = 0.979, RMSEA = 0.036, SRMR = 0.024). Abbreviation: AVE, average variance extracted.

**TABLE 5** Summary of the measurement model (biscuits made without palm oil).

Construct	Item #	Stand. factor loading	CR	Discriminant validity							
Perceived quality (PQ)	1	0.897	0.900	Squared construct correlations off-diagonal; AVE on diagonal (bold)							
	2	0.845		Constructs	PQ	GPU	EC	PBC	PCE	SN	PI
	3	0.855		PQ	<b>.750</b>						
Green perceived utility (GPU)	1	0.933	0.930	GPU	.251	<b>.870</b>					
	2	0.933		EC	.085	.099	<b>.790</b>				
Environmental concern (EC)	1	0.903	0.919	PBC	.009	.006	.007	<b>.743</b>			
	2	0.907		PCE	.104	.100	.391	.003	<b>.841</b>		
	3	0.857		SN	.059	.076	.103	.007	.105	<b>.870</b>	
Perceived behavioral control (PBC)	1	0.861	0.956	PI	.394	.163	.092	.008	.101	.040	<b>.855</b>
	2	0.874									
	3	0.852									
Perceived consumer effectiveness (PCE)	1	0.918	0.941								
	2	0.916									
	3	0.918									
Subjective norms (SN)	1	0.921	0.953								
	2	0.944									
	3	0.933									
Purchase intention (PI)	1	0.924	0.922								
	2	0.924									

Note:  $N = 2396$ ; model fit ( $\chi^2 = 497.097$  [df = 131] [ $p = .000$ ], CFI = 0.987, AGFI = 0.968, TLI = 0.983, RMSEA = 0.034, SRMR = 0.022). Abbreviation: AVE, average variance extracted.

ingredients, perceived consumer effectiveness positively influences purchase intention for biscuits made with Italian ingredients, so that mixed results are obtained referring to Hypothesis 6. Finally, indirect experience, green perceived utility, perceived behavioral control, and subjective norms do not influence the intention to purchase sustainable biscuits. Therefore, Hypotheses 1b, 3, 5, and 7 are not supported.

Regarding sociodemographic variables, results show the negative effect of age on purchase intention for biscuits made with organic ingredients and without palm oil; this effect is not confirmed for biscuits made with natural ingredients or Italian ingredients.

## 5 | DISCUSSION

This paper is aimed at analyzing the factors influencing consumers' intention to purchase sustainable biscuits. Three main categories of factors have been investigated: product familiarity (direct and indirect experience), perceived value (quality and green utility), and variables related to the TPB (environmental concern, perceived behavioral control, perceived consumer effectiveness, and subjective norms).

The results of this paper highlight that both perceived quality and environmental concern are important factors to consider when assessing consumers' intention to purchase sustainable biscuits, with perceived quality having the strongest influence. The analysis also

underscores the importance of direct experience in purchasing sustainable biscuits. However, it is important to note that this result is not robust across the different types of sustainable biscuits that have been considered. In the following, each factor is discussed in detail.

Concerning *product familiarity*, the results are partially consistent with the studies by Dewi et al. (2021), Nguyen et al. (2015), and Smith and Paladino (2010), which found it plays an important role in predicting consumers' purchase intention. Indeed, this study shows that *direct experience* is a predictor of the willingness to buy sustainable biscuits (despite this result being dependent upon the specific characteristics of biscuits), whereas *indirect experience* does not impact the intention to purchase them.

With regard to *perceived value*, several studies have proven that taste, quality, and healthiness of a product are crucial features considered by consumers when buying green food (Cerjak et al., 2010; Mondelaers et al., 2009). Consistently, our study shows that *perceived quality* is the most important factor driving the intention to purchase sustainable biscuits. In accordance with previous contributions (Ezni Balqiah et al., 2020; Smith & Paladino, 2010; Sumi & Kabir, 2018; Wong & Aini, 2017), this result highlights that the more the consumer perceives the product as having a good quality, the more he/she is willing to buy it, *ceteris paribus*.

Over the years, some studies have suggested that *green perceived utility* influences the consumers' purchase intention for green products (Chen et al., 2012; Fraccascia et al., 2023; Michaud &

**TABLE 6** Summary of the measurement model (biscuits made with Italian ingredients).

Construct	Item #	Stand. factor loading	CR	Discriminant validity							
Perceived quality (PQ)	1	0.889	0.916	Squared construct correlations off-diagonal; AVE on diagonal (bold)							
	2	0.885		Constructs	PQ	GPU	EC	PBC	PCE	SN	PI
	3	0.882		PQ	<b>.784</b>						
Green perceived utility (GPU)	1	0.926	0.923	GPU	.292	<b>.858</b>					
	2	0.926		EC	.059	.064	<b>.790</b>				
Environmental concern (EC)	1	0.903	0.919	PBC	.007	.009	.007	<b>.743</b>			
	2	0.907		PCE	.071	.070	.391	.003	<b>.841</b>		
	3	0.857		SN	.061	.091	.103	.007	.105	<b>.870</b>	
Perceived behavioral control (PBC)	1	0.861	0.956	PI	.314	.133	.099	.004	.094	.037	<b>.817</b>
	2	0.874									
	3	0.852									
Perceived consumer effectiveness (PCE)	1	0.918	0.941								
	2	0.916									
	3	0.918									
Subjective norms (SN)	1	0.921	0.953								
	2	0.944									
	3	0.933									
Purchase intention (PI)	1	0.904	0.899								
	2	0.904									

Note:  $N = 2396$ ; model fit ( $\chi^2 = 518.594$  [df = 131] [ $p = .000$ ], CFI = 0.986, AGFI = 0.967, TLI = 0.982, RMSEA = 0.035, SRMR = 0.023). Abbreviation: AVE, average variance extracted.

**TABLE 7** Structural equation model coefficients (biscuits made with natural ingredients, without dyes and preservatives).

Paths	Standardized coefficients
PQ → PI	0.740**
GPU → PI	-0.031
EC → PI	0.128**
PBC → PI	0.015
PCE → PI	0.029
SN → PI	-0.026
IE → PI	-0.014
DE → PI	0.078
Control variables	
Gender → PI	0.016
Age → PI	-0.027
Education → PI	-0.018
Income → PI	-0.006

Note:  $N = 2396$ ; model fit ( $\chi^2 = 809.974$  [df = 203] [ $p = .000$ ], CFI = 0.981, AGFI = 0.956, NFI = 0.974, TLI = 0.971, RMSEA = 0.035, SRMR = 0.022).

Abbreviations: DE, direct experience; EC, environmental concern; GPU, green perceived utility; IE, indirect experience; PCB, perceived behavioral control; PCE, perceived consumer effectiveness; PI, purchase intention; PQ, perceived quality; SN, subjective norms.

\* $p < .05$ , and \*\* $p < .01$ .

**TABLE 8** Structural equation model coefficients (biscuits made without palm oil).

Paths	Standardized coefficients
PQ → PI	0.702**
GPU → PI	0.022
EC → PI	0.109*
PBC → PI	-0.008
PCE → PI	0.004
SN → PI	-0.034
IE → PI	-0.001
DE → PI	0.161**
Control variables	
Gender → PI	0.021
Age → PI	-0.052*
Education → PI	0.011
Income → PI	0.024

Note:  $N = 2396$ ; model fit ( $\chi^2 = 722.430$  [df = 203] [ $p = .000$ ], CFI = 0.984, AGFI = 0.961, NFI = 0.978, TLI = 0.976, RMSEA = 0.033, SRMR = 0.020).

Abbreviations: DE, direct experience; EC, environmental concern; GPU, green perceived utility; IE, indirect experience; PCB, perceived behavioral control; PCE, perceived consumer effectiveness; PI, purchase intention; PQ, perceived quality; SN, subjective norms.

\* $p < .05$ , and \*\* $p < .01$ .

**TABLE 9** Structural equation model coefficients (biscuits made with Italian ingredients).

Paths	Standardized coefficients
PQ → PI	0.629**
GPU → PI	−0.041
EC → PI	0.175**
PBC → PI	−0.005
PCE → PI	0.088*
SN → PI	−0.036
IE → PI	−0.035
DE → PI	0.082*
Control variables	
Gender → PI	0.015
Age → PI	−0.026
Education → PI	−0.005
Income → PI	0.011

Note:  $N = 2396$ ; model fit ( $\chi^2 = 721.086$  [df = 203] [ $p = .000$ ], CFI = 0.983, AGFI = 0.962, NFI = 0.977, TLI = 0.976, RMSEA = 0.033, SRMR = 0.020).

Abbreviations: DE, direct experience; EC, environmental concern; GPU, green perceived utility; IE, indirect experience; PCB, perceived behavioral control; PCE, perceived consumer effectiveness; PI, purchase intention; PQ, perceived quality; SN, subjective norms.

\* $p < .05$ , and \*\* $p < .01$ .

Llerena, 2011; Yadav & Pathak, 2017). Different from what was hypothesized, our study shows that this factor does not influence the intention to buy sustainable biscuits, meaning that the awareness about the environmental performance of green products is not an important factor when considering buying biscuits. Our result is consistent with the study by Hamzah and Tanwir (2021) that, different from Kahn et al. (2007), found that green perceived utility had no significant relationship with the intention to purchase hybrid vehicles. In this regard, Hamzah and Tanwir (2021) suggested that the impact of green perceived utility on purchase intention could be contingent on consumers' familiarity with the product's characteristics and attributes. Therefore, different results can be found for different categories of products.

Let us address the factors related to the TPB. Over the years, several studies have investigated the growth of *environmental concern* among consumers and its impact on green consumption and pro-environmental behavior (Felix et al., 2018; Kilbourne & Pickett, 2008). This study highlights that the more the consumer is concerned about the environment, the more he/she is willing to buy sustainable biscuits, *ceteris paribus*. This result is consistent with most previous studies, referring to green products in general (e.g., Alzubaidi et al., 2021), to specific categories of green products (e.g., Dangelico et al., 2022), and specifically to green food (Kilbourne & Pickett, 2008; Shen & Chen, 2020; Sumi & Kabir, 2018).

**TABLE 10** Summary of hypotheses and results.

Hypotheses	Results: organic ingredients	Results: natural ingredients	Results: without palm oil	Results: Italian ingredients	Overall results
Hypothesis 1a: Direct experience positively influences the consumer's purchase intention for sustainable biscuits.	Supported	Not supported	Supported	Supported	Mixed results
Hypothesis 1b: Indirect experience positively influences the consumer's purchase intention for sustainable biscuits.	Not supported	Not supported	Not supported	Not supported	Not supported
Hypothesis 2: Perceived quality positively influences the consumer's purchase intention for sustainable biscuits.	Supported	Supported	Supported	Supported	Fully supported
Hypothesis 3: Green perceived utility positively influences the consumer's purchase intention for sustainable biscuits.	Not supported	Not supported	Not supported	Not supported	Not supported
Hypothesis 4: Environmental concern positively influences the consumer's purchase intention for sustainable biscuits.	Supported	Supported	Supported	Supported	Fully supported
Hypothesis 5: Perceived behavioral control positively influences the consumer's purchase intention for sustainable biscuits.	Not supported	Not supported	Not supported	Not supported	Not supported
Hypothesis 6: Perceived consumer effectiveness positively influences the consumer's purchase intention for sustainable biscuits.	Not supported	Not supported	Not supported	Supported	Mixed results
Hypothesis 7: Subjective norms positively influence the consumer's purchase intention for sustainable biscuits.	Not supported	Not supported	Not supported	Not supported	Not supported

Results of this paper show that *perceived behavioral control* is not significant in predicting the purchase intention of sustainable biscuits. In this regard, the literature on sustainable food reports conflicting results: While some studies have underscored the positive influence exerted by *perceived behavioral control* for organic food (Dean et al., 2012; Saleki et al., 2020; Wong & Aini, 2017), other studies have found that *perceived behavioral control* does not impact the consumers' willingness to buy organic food (Rahman & Noor, 2016; Yazdanpanah & Forouzani, 2015; Zayed et al., 2022). Similarly, Dean et al. (2008) found that the *perceived behavioral control* has a significant impact on the intention to purchase organic fresh apples, while it does not affect the intention to purchase organic pizza. This study is consistent with the idea that the impact of *perceived behavioral control* can be highly product-specific.

Further, the results highlight that the effect of *perceived consumer effectiveness* on the purchase intention of sustainable biscuits depends on the characteristics of these biscuits. Specifically, a positive influence was found only for biscuits made with Italian ingredients; this is consistent with previous studies highlighting a positive impact of *perceived consumer effectiveness* on the purchase intention of green food products (Minbashrazgah et al., 2017; Verhoef, 2005; Vermeir & Verbeke, 2008). For the other types of biscuits—that is, those with organic ingredients and natural ingredients and those without palm oil—*perceived consumer effectiveness* is found not to affect the willingness to buy them, different from what is discussed by the literature. This issue suggests that the influence of *perceived consumer effectiveness* might depend on the characteristics of the specific product, even in the same product category.

Further, our results show that *subjective norms* do not influence the intention to purchase sustainable biscuits. Also, in this case, the literature on sustainable food reports conflicting results. The positive impact of *subjective norms* is confirmed for organic milk (Carfora et al., 2019), organic apples (Dean et al., 2008), organic tomatoes (Dean et al., 2012), sustainable chocolate (Salazar et al., 2013), organic meat (Wong & Aini, 2017, for Malaysian consumers), and organic vegetables (Dorce et al., 2021), whereas it is not confirmed in the case of green chicken (Minbashrazgah et al., 2017), organic meat (Nguyen et al., 2021, for Vietnamese consumers), and organic fish (Budhathoki et al., 2022). All in all, this highlights that the influence of *subjective norms* depends on the specific type of food product and that, even for the same product category, can be country specific.

Concerning the sociodemographic variables, our study found that *age* negatively impacts purchase intention, despite this result is specific only for biscuits made with organic ingredients and biscuits made without palm oil. Accordingly, young consumers are more likely to purchase the abovementioned types of biscuits; this result is consistent with previous studies (James et al., 2019; Lin & Wu, 2018).

## 6 | CONCLUSIONS

This section concludes the paper with implications (Section 6.1) as well as limitations and future research directions (Section 6.2).

## 6.1 | Implications

This study has several implications, useful for scholars as well as practitioners and policymakers.

First, this study contributes to the literature on sustainable consumer behavior by integrating the TPB with product familiarity and perceived value, two relevant determinants of purchase intention for green products (e.g., Dangelico et al., 2022; Yadav & Pathak, 2017). Furthermore, two dimensions of perceived value (product quality and green utility) and two types of product familiarity (direct and indirect experiences) were considered. This contributes to providing a broader picture of the complex phenomenon of sustainable consumption. Results of this paper highlight that perceived product quality (meant as overall quality, taste, and healthiness) and environmental concern are important determinants of purchase intention for sustainable biscuits, regardless of the specific biscuits' characteristics. This result, which is consistent with other studies focused on other product categories (e.g., fashion products in Dangelico et al., 2022), suggests that the perceived quality of green products and the concern that consumers have toward the natural environment play a key role in determining purchase intention. Alternatively, the mixed results observed regarding the effect of direct experience and perceived consumer effectiveness suggest that their significance as determinants of sustainable purchase behavior may be dependent upon the product category and, even within the same category, upon specific green characteristics of products.

This study provides several insights useful for practitioners. First, it highlighted that there is little product familiarity with sustainable biscuits; indeed, most of the respondents (more than 70%) do not believe they have ever purchased or heard about the different types of sustainable biscuits. It is likely that they may have even bought these products, but without being fully aware about their characteristics. This prompts the need for increasing product familiarity, for instance, through specific marketing actions, such as free taste within points of sale, promotion of sales, and clear advertising and labeling. Second, perceived quality is the main determinant of purchase intention for sustainable biscuits. Thus, it is very important for marketers to not sacrifice product quality in favor of sustainability; rather, sustainability should be leveraged to boost product quality, for example, emphasizing in product advertising and labeling that the use of sustainable raw materials can be healthier for consumers.

This research also highlights that environmental concern is an important determinant of purchase intention of sustainable biscuits. Thus, public communication campaigns should be designed to increase citizens' awareness about the state of the natural environment, as well as to highlight the importance of protecting it and to underline the relevance that consumption behavior can play in this regard.

## 6.2 | Limitations and future research directions

Some limitations should be acknowledged as well. First, this study focused on Italian consumers and is based on a nonprobabilistic

sample, which is not representative of the whole Italian population, so limiting the generalizability of results. Nevertheless, the potential risks of sampling biases are mitigated by the large number of respondents (Atkinson & Flint, 2001). Second, the study is focused on sustainable biscuits, considering four different characteristics, related to raw materials. The authors are aware that other options are available to make cookies more sustainable, for example, referred to production processes or packaging. Future research could be devoted to investigate consumers' behavioral intention toward biscuits with sustainable characteristics related to these kinds of options. Further, since consumer behavior toward sustainable products may be highly dependent upon the type of product, caution should be made in generalizing this study results to the whole food industry; accordingly, future studies on consumer behavior toward sustainable food are encouraged to be product specific, rather than referred to general food products. Moreover, since this study highlighted that the effect of direct experience and perceived consumer effectiveness on sustainable purchase behavior may be dependent upon specific green characteristics of products, future research should aim to provide additional insights into the distinctive nature of consumers' decision-making processes regarding different products, investigating the mechanisms leading direct experience and perceived consumer effectiveness to influence purchase intention for some product categories (or products with specific characteristics) but not for others. In addition, the model could be extended including moderating effects on the relationships among the independent variables and the purchase intention. Finally, since national culture may affect consumer behavior (e.g., Gentina et al., 2014; Soyez, 2012), this model should be tested in other countries so as to allow cross-country comparisons and to understand the effect of national culture.

Hopefully, this study may contribute to increasing knowledge and stimulating further research on sustainable consumer behavior in the food industry, consistently with the United Nations Sustainable Development Goal no. 12 (sustainable production and consumption).

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## APPENDIX A

TABLE A1 Scales.

	Item	Mean	Standard deviation	Cronbach's $\alpha$ / Spearman–Brown's coefficient <sup>a</sup>
Perceived quality: organic ingredients	I think the quality of biscuits with these characteristics is higher than that of conventional biscuits	4.111	1.007	.804
	I think biscuits with these characteristics have a better taste than conventional biscuits	3.695	1.091	
	I think biscuits with these characteristics are healthier than conventional biscuits	4.343	0.972	
Perceived quality: natural ingredients	I think the quality of biscuits with these characteristics is higher than that of traditional biscuits	4.370	0.904	.743
	I think biscuits with these characteristics have a better taste than traditional biscuits	3.870	1.091	
	I think biscuits with these characteristics are healthier than traditional biscuits	4.540	0.856	
Perceived quality: without palm oil	I think the quality of biscuits with these characteristics is higher than that of traditional biscuits	3.948	1.152	.833
	I think biscuits with these characteristics have a better taste than traditional biscuits	3.563	1.160	
	I think biscuits with these characteristics are healthier than traditional biscuits	4.158	1.124	
Perceived quality: Italian ingredients	I think the quality of biscuits with these characteristics is higher than that of traditional biscuits	4.030	1.040	.862
	I think biscuits with these characteristics have a better taste than traditional biscuits	3.800	1.094	
	I think biscuits with these characteristics are healthier than traditional biscuits	3.890	1.120	
Green perceived utility: organic ingredients	I think biscuits with these characteristics are good for the environment	4.232	0.939	.816
	I think biscuits with these characteristics can effectively reduce pollution	4.067	1.034	
Green perceived utility: natural ingredients	I think biscuits with these characteristics are good for the environment	4.084	1.011	.806
	I think biscuits with these characteristics can effectively reduce pollution	3.935	1.086	
Green perceived utility: without palm oil	I think biscuits with these characteristics are good for the environment	3.890	1.126	.850
	I think biscuits with these characteristics can effectively reduce pollution	3.730	1.167	
Green perceived utility: Italian ingredients	I think biscuits with these characteristics are good for the environment	3.641	1.132	.834
	I think biscuits with these characteristics can effectively reduce pollution	3.622	1.162	
Environmental concern	I am very concerned about the environment	4.466	0.796	.867
	I would be willing to reduce or change my consumption to help protect the environment	4.414	0.825	
	Protecting the natural environment increases my quality of life	4.525	0.812	
Perceived behavioral control	Sustainable biscuits might be readily available in general	2.676	1.136	.827



TABLE A1 (Continued)

	Item	Mean	Standard deviation	Cronbach's $\alpha$ / Spearman–Brown's coefficient <sup>a</sup>
	The retail outlets of sustainable biscuits might be located near from where I live	3.044	1.189	
	It is easy to obtain information regarding what biscuits are sustainable	2.766	1.216	
Perceived consumer effectiveness	It is worth it for the individual consumer to make efforts to preserve and improve the environment	4.470	0.817	.905
	Since each individual can have any effect upon environmental problems, what I do can make a meaningful difference	4.380	0.880	
	By purchasing products made in an environmentally friendly way, each consumer's behavior can positively affect the environment and society	4.460	0.811	
Subjective norms	People who are important to me think that I should use environmentally friendly products	3.344	1.129	.925
	People who influence my behavior think that I should use environmentally friendly products	3.256	1.136	
	People whose opinions that I value prefer that I use environmentally friendly products	3.377	1.141	
Purchase intention: organic ingredients	I am likely to buy biscuits with these characteristics	4.068	0.994	.788
	I am willing to buy biscuits with these characteristics	4.386	0.926	
Purchase intention: natural ingredients	I am likely to buy biscuits with these characteristics	4.299	0.932	.791
	I am willing to buy biscuits with these characteristics	4.527	0.848	
Purchase intention: without palm oil	I am likely to buy biscuits with these characteristics	4.117	1.060	.830
	I am willing to buy biscuits with these characteristics	4.337	0.992	
Purchase intention: Italian ingredients	I am likely to buy biscuits with these characteristics	4.210	0.947	.776
	I am willing to buy biscuits with these characteristics	4.468	0.872	

<sup>a</sup>Spearman–Brown's coefficient is reported for two-item scales.

TABLE A2 Distribution of responses related to product familiarity.

		I have purchased (direct experience) (%)	I have never purchased but have heard of them (indirect experience) (%)	I have never purchased and never heard of them (no experience) (%)
Product familiarity	Organic ingredients	4.1	25.2	70.7
	Natural ingredients	2.7	15.0	82.4
	Without palm oil	2.0	8.1	89.8
	Italian ingredients	4.3	13.0	83.4

**TABLE A3** Distribution of responses for items related to perceived quality, green perceived utility, and purchase intention for the different types of sustainable biscuits (from 1 = *strongly disagree* to 5 = *strongly agree*).

			1	2	3	4	5
Perceived quality	I think the quality of biscuits with the following characteristics is higher than that of traditional biscuits	Organic ingredients	2.8	4.3	16.1	32.7	44.1
		Natural ingredients	2.2	2.2	9.3	29.0	57.3
		Without palm oil	4.8	7.1	18.9	26.8	42.4
		Italian ingredients	3.0	4.7	20.5	29.8	42.1
	I think biscuits with the following characteristics have a better taste than traditional biscuits	Organic ingredients	4.1	8.3	29.5	29.8	28.1
		Natural ingredients	3.7	7.1	23.8	29.9	35.6
		Without palm oil	5.5	11.4	31.7	24.2	27.2
		Italian ingredients	4.1	6.4	28.4	28.0	33.1
	I think biscuits with the following characteristics are healthier than traditional biscuits	Organic ingredients	2.8	3.4	8.9	26.5	58.4
		Natural ingredients	2.0	2.7	4.4	21.5	69.5
		Without palm oil	4.1	5.8	14.4	21.5	54.1
		Italian ingredients	4.2	6.1	25.4	25.1	39.2
Green perceived utility	I think biscuits with the following characteristics are good for the environment	Organic ingredients	2.2	3.3	12.3	33.6	48.6
		Natural ingredients	2.3	5.1	18.3	30.6	43.8
		Without palm oil	3.9	7.2	24.0	25.2	39.6
		Italian ingredients	5.0	8.5	33.2	24.2	29.2
	I think biscuits with the following characteristics can effectively reduce pollution	Organic ingredients	2.9	4.5	19.1	29.7	43.7
		Natural ingredients	3.5	6.2	22.9	28.1	39.3
		Without palm oil	5.1	8.5	28.9	23.3	34.1
		Italian ingredients	5.4	9.8	31.7	23.3	29.8
Purchase intention	I am likely to buy biscuits with the following characteristics	Organic ingredients	3.3	3.7	16.4	37.1	39.8
		Natural ingredients	2.6	2.8	9.0	33.3	52.3
		Without palm oil	3.5	4.8	15.4	28.8	47.4
		Italian ingredients	2.3	2.8	14.5	32.6	47.9
	I am willing to buy biscuits with the following characteristics	Organic ingredients	2.7	2.4	7.7	27.9	59.0
		Natural ingredients	2.0	2.3	4.2	23.7	67.7
		Without palm oil	2.8	3.7	10.4	23.3	59.8
		Italian ingredients	1.9	2.0	8.3	23.1	64.8