

Enhancing consumers' pro-environmental purchase intentions: the moderating role of environmental concern

Francesca De Canio^{id} and Elisa Martinelli^{id}

Department of Economics Marco Biagi, University of Modena and Reggio Emilia, Modena, Italy, and

Emiro Endrighi^{id}

Department of Life Science, University of Modena and Reggio Emilia, Modena, Italy

Abstract

Purpose – Environmental concern is getting increasing importance in consumer shopping decisions. Nevertheless, to date, sustainable packaged foods are not always the first option when consumers go shopping. This paper analyses how environmental concern moderates the role played by external factors – preference towards sustainable retailers and trust in sustainable producers – in determining consumer purchase intentions for sustainable packaged foods. Consumer involvement in eco-friendly labels, increasingly present in food packages, is investigated as indirectly impacting pro-environmental purchase intentions.

Design/methodology/approach – An online survey administered to a sample of Italian food shoppers is used for the empirical analysis. A total of 278 structured questionnaires were modelled using a structural equation modelling approach.

Findings – Findings show that producers and retailers' policies in favour of sustainability are key in determining consumers' sustainable purchase intentions. Further, coherent uses of labels and logos in light of sustainability can support consumer purchase decisions. Relevant is the influence played by the environmental concern in both supporting pro-environmental purchase intentions and in amplifying the trust in sustainable producers-purchase intentions path.

Originality/value – This study contributes to the literature on sustainability showing how producers and retailers may together influence consumers' pro-environmental purchase intentions. Findings extend the retail literature on the impact of producers and retailers' policies on consumers' sustainable purchases. Further, environmental concern is investigated in its moderating role on the impact of external factors on consumers' pro-environmental purchase intentions.

Keywords Pro-environmental purchase intentions, Environmental concern, Sustainable packaged foods, Sustainable retailers, Sustainable producers, Eco-friendly labels

Paper type Research paper

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Although the paper is the result of the collaborative work of the three authors, Francesca De Canio settled introduction, conceptual framework and hypotheses, data curation, methodology, formal analysis and results and the theoretical contributions (contribution: ca. 50%); Elisa Martinelli cared Hypothesis 1 and the managerial contributions (contribution: ca. 40%); Emiro Endrighi developed the conclusions section (contribution: ca. 10%).



1. Introduction

The great attention to environmental and sustainability concerns in society are leading scholars and practitioners to study the reasons behind the purchase and consumption of sustainable food products. Extant pro-environmental consumer behaviour literature is increasingly aimed at investigating the motives that can lead consumers to minimize the impact of their shopping and consumption habits on the environment (Grimmer *et al.*, 2016). This research stream, strongly braced by the sustainable guidelines of the European Union and from the Sustainable Movement organizations spreading worldwide, is nowadays undergoing a further transformation due to Covid-19. The Covid-19 pandemic has badly impacted on consumer mindset (Cachero-Martinez, 2020). As a consequence of the restriction determined by the social distancing and the governmental lockdowns, consumers have rediscovered the primary role of nature and the environmental concern. Further, as during lockdowns most of the consumption took place at home, consumers have increased their spending on food products, opting for higher quality products. Therefore, they started to give more attention to sustainable shopping products, opting for green foods (Qi *et al.*, 2020). Consumers are increasingly willing to adopt responsible purchasing decisions respectful of the environment (Chen and Hung, 2016; Tanner and Kast, 2003). However, recent studies proved that environmental consciousness hardly turns into real changes in behaviours (Lucarelli *et al.*, 2020; Grimmer *et al.*, 2016). For this reason, it is not sufficient to promote pro-environmental consumer behaviours stimulating consumers' internal factors. Hence, attitudinal aspects (e.g., Koenig-Lewis *et al.*, 2014) and demographics (Carrigan and Attalla, 2001) should be leveraged jointly with external factors in order to motivate and involve consumers to behave sustainably in a comprehensive way. Literature sheds some light on external factors that may influence consumer behaviour. Among others, the role played by the food supply chain players and their strategies in stimulating pro-environmental consumer behaviours are emerging as relevant (Tsarenko *et al.*, 2013). Producers are increasingly adopting sustainable production processes to improve their sustainable image. Similarly, retailers have started to switch up to compostable bags. Though it is not enough. A lot of waste comes from plastic packaging and producers and retailers have the power to induce positive changes in consumer mindset in favour of environmental sustainability (Beitzen-Heineke *et al.*, 2017).

Product packaging can play an important role, especially when it displays eco-friendly features. The packaging can be particularly harmless to the environment as it may create litter that cannot be 100% recycled, increasing waste. Specifically, food packaging strongly contributes to household waste, mainly due to excessive product packaging (Chen *et al.*, 2017) and to the need to be carefully separated and cleaned to be recycled (Klaiman *et al.*, 2017). Accordingly, spurring consumers going food shopping to choose products with sustainable packaging can be a powerful tool to reduce pollution. The economic and business opportunities deriving from this shift towards sustainability are relevant too. The global sustainable packaging market-value is expected to reach around US\$ 255 billion by 2026, growing at a CAGR of 7% over the forecast period 2019–2026, with Europe holding the highest market share (Acumen, 2019).

Accordingly, recyclable and compostable packaging is part of companies' green policies and Europe has progressed further from this point of view (EU Commission, 2019). Food packaging has the role to prevent food during storage and transportation, prolong the shelf-life and preserve its freshness and its organoleptic properties (Topuz and Uyar, 2020). Although its strategic role for the overall food industry, the development and diffusion of sustainable packaging is still lagging, continuing in harming the environment. It is estimated that in Italy, for example, 2 million tons of packaging are placed on the market annually with a low number of companies producing and distributing sustainably packaged foods (Nomisma and Spinlife, 2019). To be adopted by a wide range of food system players, a change in sustainable food-packaging should be cost-competitive (Reynolds *et al.*, 2019), but it is also important that

sustainability becomes inherently embedded into the corporate values and that the market, especially final consumers, recognise the added-value of adopting sustainable strategies.

Previous studies have revealed that consumers favour eco-friendly packed products over conventional ones (Magnier and Schoormans, 2015). They believe that avoiding excessive packaging can have the strongest impact on the environment (Tobler *et al.*, 2011). Nevertheless, the great consumer attention to environmental issues usually fails to translate into actual behaviours (Tsarenko *et al.*, 2013). However, external influences can play a role. In the food industry, efficient value chain design and effective coordination between food supply chain players are considered key to reducing food wastage (Govindan, 2018). Producers and retailers operating in the food system are called to adopt sustainable policies and practices. However, the study of the role and influence played by food producers and retailers in addressing consumer pro-environmental intentions is deficient in the academic literature, especially as concerns retailers (Tsarenko *et al.*, 2013). Naidoo and Gasparatos (2018) evidenced a lack of studies on the stakeholder engagement initiatives related to the corporate strategies that retailers are pursuing, particularly regarding customer-focused sustainability strategies. Due to their pivotal position in the supply chain, retailers can generate significant waste reductions cooperating with their suppliers and influencing their customers' choices. This role has brought some authors to consider retailers as "green multipliers" in globally distributed supply chains (Lai *et al.*, 2010; Kotzab *et al.*, 2011); key actors in encouraging sustainability in both production and consumption practices.

Within this context, the present study aims at investigating the role played by the players of the food supply-chain – namely producers and retailers – in determining consumers' pro-environmental purchases. By analysing a group of sustainability-conscious individuals, the study analyses how the sustainable practices adopted by producers and retailers may influence consumers' purchase intentions for sustainable packaged food products. Shedding some light on the role played by external factors, the study first aims to find a tool that generates concrete pro-environmental consumers behaviours. Second, exploring the moderating role of the attitude of consumers towards the environmental concern, the research proposes operational strategies aimed at amplifying the effectiveness of sustainable CSR strategies of the food supply-chain operators.

The study investigates the effect of external influences impacting on consumer pro-environmental food purchase intentions. Specifically, this article investigates the direct effect generated by sustainable policies of retailers and agri-food producers on consumer purchase intentions for sustainable packaged food products. The indirect impact exerted by consumer involvement in eco-friendly labels through trust in sustainable producers is also explored. Last but not least, the consumers' environmental concern is explored as both a direct driver of pro-environmental purchase intentions and a moderator of the impact of external factors on sustainable purchase intentions.

In sum, from a theoretical standpoint, first, the paper contributes to the food and retailing literature by analysing the impact of the external influence of the policies implemented by the members of the food supply chain on consumer purchase intentions for sustainable packaged food products. Second, it sheds some light on the interaction between internal and external factors. From a managerial standpoint, the paper evidences that supply chain players can effectively stimulate consumers' pro-environmental purchase intentions and suggests that joint policies between producers and retailers may promote a higher consumer proneness to buy environment-friendly products. Moreover, through our work, it is possible to derive that food producers can reinforce the effect of their environment-friendly claim on consumer purchase intentions by using eco-labelling strategies.

The paper, after presenting the conceptual model proposed and the hypotheses underpinning it, describes the methodology employed and the results obtained. Then, a discussion on the theoretical and managerial implications deriving from the findings is reported. The paper ends with the conclusion paragraph, depicting the limitation of the current study and possible avenues for future research.

2. Conceptual framework and research hypotheses

This research aims to propose a model investigating consumer purchase intentions for sustainable packaged food products. The literature found different internal factors able to influence consumers' sustainable purchase intentions and consumption (e.g., social responsibility, attitude, environmental concern and willingness to pay) (Hao *et al.*, 2019; Vermeir and Verbeke, 2006). Nevertheless, previous studies on consumers' sustainable shopping have largely ignored the role exerted by external factors in influencing consumers' pro-environmental purchase intentions. Specifically, the model herein proposed, explores the interrelated role of both external factors (i.e., producers and retailers influence, eco-labels) and internal factor (i.e., environmental concern) in influencing consumers' intention to buy sustainable food products.

In their primary role of assortments selection and final customer relationship management, retailers play an active role in shaping and modifying consumers' behaviours. This influence can also be directed to promote sustainable consumer practices, following the increasing number of consumers demanding corporate social responsibility approaches (Naidoo and Gasparatos, 2018). Customers call for retail businesses respectful of the environment and able to diminish food waste (Young *et al.*, 2018). The retailer's store can act "as a place for exchange of information, ideas and understanding of what it means to consume sustainably" (Lehner, 2015, p. 389). Retailers' in-store marketing communication can encourage pro-environmental purchasing and consumption by mixing commercial goals with the commitment to sustainability (Jones *et al.*, 2011). Perrini *et al.* (2010) found that Italian consumers are more likely to trust retailers of organic products if they perceive the retailer as highly committed to the environment. Young *et al.* (2018) found that retailers can influence the pro-environmental behaviour of customers using conventional communication channels, while van Giesen and Leenheer (2019) stated a similar effect when innovative retail store formats based on digital displays spreading sustainability information are used. Su *et al.* (2021) found – among other retail-based contextual factors – that the retailers' environmental reputation has a direct and positive impact on consumers' shopping behaviours. That is why retailers are increasingly improving the environmental sustainability of their value-chain (Saber and Weber, 2019). As a consequence, we can postulate the following hypothesis:

H1. The preference for sustainable retailers positively stimulates consumers' pro-environmental purchase intentions.

Strongly communicating the company's vocation towards a sustainable production represents both a competitive strategy to differentiate the offer and a tool to support informed consumer choices. Nevertheless, not always consumers can link green manufacturer with pro-environmental products (Pickett-Bake and Ozaki, 2008). For this reason, manufacturers, and in particular food producers, are implementing CSR strategies, sustainable packaging and eco-friendly labels of their products to influence consumers' purchasing choices. De Canio and Martinelli (2020) found that recyclable packaging and sustainable production practices are exerting a relevant role in the purchase of EU quality labels and organic food products. Bonn *et al.* (2016) proved that consumers' perceptions of sustainable practices employed by wine producers affect consumer decision making relative to organic wine. Consumer trust in sustainable producers was found relevant in addressing consumers' purchase intentions for organic food products (Voon *et al.*, 2011).

Label information is useful to support the consumer purchase decision-making process. Indeed, eco-friendly labels, influencing consumer trust in the sustainability claims of the producer, play a relevant role in inducing consumer purchase intentions (Chekima *et al.*, 2016). Le *et al.* (2020) evidenced that Vietnamese consumers in evaluating credence goods such as food trust supply-side indicators – such as labelling and store reputation – the most. Labels and logos play a relevant role in delivering the company's green attitude (Tauflique

et al., 2019). *Chekima et al.* (2016) showed that the sustainability claim driven by eco-friendly labels is perceived as more trustworthy when supported by a third-party (e.g., institutions and governments). *Testa et al.* (2015) found that eco-labels are useful to drive purchasing choices only when exploited by companies' marketing activities, confirming the results of *Tanner and Kast* (2003). Similarly, we hypothesise that eco-friendly labels support consumer trust in sustainable food producers and, accordingly, influence consumer purchase intentions for sustainable packaged foods as follows:

- H2. Trust in sustainable producers positively influences consumers' pro-environmental purchase intentions.
- H3. Consumer involvement in eco-friendly labels positively influences trust in sustainable producers.

Environmental concern represents the consumer's general attitude toward preserving the environment (*Chen and Chai*, 2010; *Wei et al.*, 2018). It plays a central role in pro-environmental consumer behaviours. In particular, it is considered to be a strong influencer of consumers' motives towards the adoption of a sustainable lifestyle (*Newton et al.*, 2015; *Wei et al.*, 2018). *Hartmann and Apaolaza-Ibañez* (2012) proved the impact of environmental concern on purchase intentions in the context of green energy brands. Environmental concern represents a key driver for sustainable food purchase intentions (*Hao et al.*, 2019; *Tanner and Kast*, 2003; *Vermeir and Verbeke*, 2006), as environmentally conscious consumers prefer to purchase products having a less impact on the environment (*Taufique et al.*, 2019). Furthermore, the Covid-19 pandemic has amplified the sensitivity of consumers towards a more sustainable and environmentally friendly purchasing (*Qi et al.*, 2020). Recently, scholars are starting to investigate how the greater environmental sensitivity expressed by consumers, may amplify consumers organic food purchase intentions (*Cachero-Martínez*, 2020; *Tandon et al.*, 2020). Similarly, we explore how environmental concern moderates the impact of external factors on consumers' pro-environmental purchase intentions as follows:

- H4a. Environmental concern positively influences consumers' *purchase intentions for sustainable packaged food products*.
- H4b. Environmental concern moderates the relationship between retailers' sustainable perception and consumers' *pro-environmental purchase intentions*.
- H4c. Environmental concern moderates the relationship between trust in sustainable producers and consumers' pro-environmental purchase intentions.

Figure 1 depicts the theoretical model and the framework for the empirical analysis. Demographic variables, such as age, sex and income, are included in the theoretical model as control variables.

3. Methodology

3.1 Survey design and data

To empirically investigate consumer purchase intentions for sustainable packaged foods, we conducted an online survey among sustainability-conscious grocery shoppers. Italians are increasingly attentive to the food products they buy and consume (*AgriFood Monitor*, 2016). The *GSI Italian report* (2020) found out that eco-labelled food products showed a +5.7% in 2019 sales, accounting for €2.2 bn. Moreover, 20% of Italians consider the change of fruit and vegetable packaging to be urgent (*Nomisma and Spinlife*, 2019). As 43% of Italians' food choices are determined by the environmental impact of packaging, producers and retailers operating in this market are called to ensure a green change of their offer (*UCIMA*, 2020).

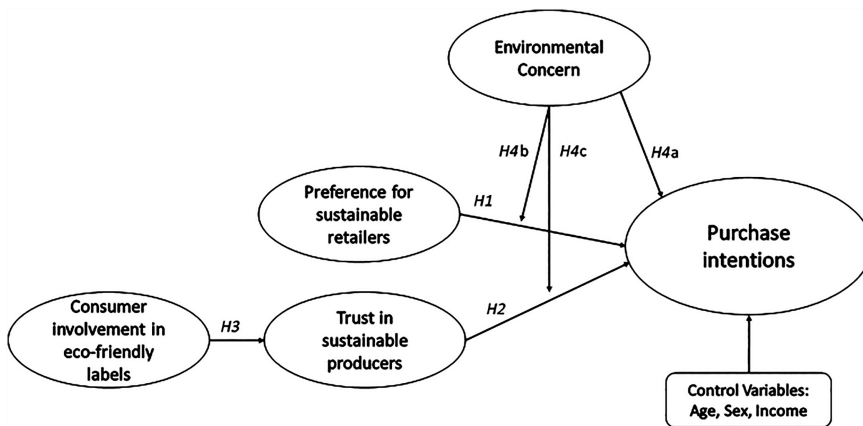


Figure 1.
Conceptual model

The survey was conducted from March 8th till March 24th 2020. Due to the lockdown restrictions because of the pandemic, the data collection was conducted online, by the means of social networks. The use of social networks to reach the selected target is becoming very common in consumer behaviour (Poll and Stern, 2020) since the Covid-19 restrictions. Seven Facebook groups focusing on ecology and environment, zero waste, responsible consumption and sustainability were selected based on the following criteria: their main topic of discussion, the frequency of interaction among members (at least 3 posts per day) and as not directly connected to a particular company and/or public and private association. No rewards were attributed to respondents. From the potential target of 22,296 members of the selected Facebook groups, we finally collected 299 responses (response rate: 1.34%). A total of 278 questionnaires were deemed useable and considered valid for the empirical analysis. The sample is deemed as reliable to estimate the main effects hypothesised in the theoretical background (Iacobucci, 2010).

The questionnaire comprised two sections: one dedicated to measuring the constructs of the theoretical model and one dedicated to the collection of demographic data. The latter showed a sample mainly composed of females (66%). The gender ratio is consistent with the profile delineated by Censis and Coldiretti report (2009) which highlights a female predominance among Italian buyers (61%). The stronger role of females as food decision-makers is also confirmed by previous studies on the Italian grocery market (e.g., De Canio and Martinelli, 2020), as well as in other national contexts (e.g., Hong *et al.*, 2020). Half of the sample is composed by young shoppers (age < 30 – $n = 154$), however no significant differences in the constructs score based on age have been identified – a unique exception being the consumers' purchase intention ($\Delta\text{mean} = 0.39$, $p\text{-value} = 0.02$). The largest group of respondents (35%) had a master-degree, followed by those who had a high school degree (32%). Similarly, consistent is the group of those with a full-time job (44%) while students represent 34% of the sample. One out of two respondents (50%) earns less than 36,000€ and 41% of the sample earns between 36,000€ and 70,000€. Respondents buy packaged goods mostly in supermarkets (79%), specialised stores (8%) and hypermarkets (7%). A detailed demographic description of the sample is reported in Table 1.

3.2 Measures of the structured questionnaire

All the items included in the questionnaire were measured on a seven-point Likert scale anchored from 1 (completely disagree) to 7 (completely agree). Consumer purchase intentions

Variables		N	%
Gender	Male	94	34%
	Female	184	66%
Age	<20	13	5%
	21–30	141	51%
	31–40	46	17%
	41–50	26	9%
	>50	52	19%
Income	< € 36,000	138	50%
	€ 36,000–70,000	115	41%
	€ 70,000–100,000	16	6%
	> € 100,000	9	3%
		6	2%
Education Level	Middle school	88	32%
	High school	66	24%
	Bachelor degree	118	43%
	Postgraduate	95	34%
Employment	Student	15	5%
	Unemployed	121	44%
	Employed: full-time	33	12%
	Employed: part-time	14	5%
	Retired/housewife	220	79%
Shopping channel	Supermarket	20	7%
	Hypermarket	21	8%
	Specialized store	14	5%
	Local market	3	1%
	Others (web, app, catalog)		

Table 1.
Socio-demographic
characteristics of the
sample

for sustainable packaged food products (PI) were measured using five items adapted from the contributions of [Lee and Yun \(2015\)](#) and [Qi and Ploeger \(2019\)](#). A four-item scale was used to assess the construct of trust in sustainable producers (PRO); the scale was derived from [Voon et al. \(2011\)](#). The preference towards sustainable retailers (RET), measured through a three-item scale, was developed using the previous study of [Tsarenko et al. \(2013\)](#). Environmental concern (EC), measured on four items, was adapted by [Chen and Chai \(2010\)](#). Consumer involvement in eco-friendly labels (LAB) was measured using three items derived by [Taufique et al. \(2019\)](#). Measurements are detailed in [Table 2](#).

3.3 Common method bias

To control for the common method bias (CMB) several techniques were used. To threat a-priori bias, typical in cross-sectional studies, several procedures were followed in developing the questionnaire. A double translation English-Italian Italian-English was conducted to reduce linguistic bias ([Maneesriwongul and Dixon, 2004](#)). A group of 20 students of a Master's course in Languages and Economics tested the survey to ensure an acceptable comprehension of items ([Klaiman et al., 2017](#)). Items were distributed in three screen questions batteries. Items were mixed between screens' batteries and within the same battery, to reduce response bias ([Danaher and Haddrell, 1996](#)).

Several *a posteriori* common method variance tests were then performed to control for any response bias within the dataset. Using the Harman's single factor method, we found that the unrotated single factor explains only 41.86% of the total variance, while the multi-factor solution explains 68.27% of the overall variance ([Podsakoff et al., 2003](#)). In line with the work of [Bagozzi et al. \(1991\)](#), none of the correlations between latent constructs is higher than 0.9 (see [Table 3](#)). Further, to explore potential problems of CMB, we implemented the CFA

Constructs	Items	Standardized factor loadings	t-value	Consumers' pro-environmental purchase intentions
Purchase Intention for sustainable packaged food products (PI)	If I had to do it again, I would buy sustainable packaged food products	0.918	n.a.	1319
	I try to buy sustainable packaged food products because it is the best choice for me	0.893	27.966	
	I consider myself to be a loyal patron of eco-friendly products	0.796	17.494	
	I am willing to buy sustainable packaged food products while shopping	0.877	23.635	
	I will try to buy sustainable packaged food products in the near future	0.877	19.600	
Trust in sustainable PROducers (PRO)	I trust that those selling sustainable products are honest about the sustainability of their products	0.786	n.a.	
	I trust that producers of sustainable products are practicing honestly	0.852	11.570	
	I trust the environmentally sustainable logo	0.884	11.589	
	I trust the information on sustainable product label	0.880	11.654	
Preference for sustainable RETailers (RET)	I like retailers who take a significant stance on protecting the environment	0.948	n.a.	
	I favor retailers who promote themselves as environment-friendly	0.929	28.342	
	I would spend more with a retailer that takes a significant stance on the environment	0.701	13.549	
Environmental Concern (EC)	If all of us, individually, contributed to environmental protection, it would have a significant effect	0.856	n.a.	
	Everyone is responsible for protecting the environment in their everyday life	0.900	20.669	
	Preserving and protecting the environment should be one of our priorities	0.853	14.008	
	We should take responsibility for environmental issues, as we are the cause of environmental damage	0.859	19.348	
Consumer involvement in eco-friendly LABels (LAB)	I search for any logo or label on the product endorsing environmental concern when buying any product	0.842	n.a.	
	I consider myself informed about eco-labels	0.691	11.926	
	I consider myself an expert in terms of my knowledge of eco-labels	0.728	11.395	

Note(s): n.a. = not available. *CFA model fit:* $\chi^2_{S-B(184)} = 359.936$; $\chi^2/df = 1.96$; RMSEA = 0.0588, $p > 0.0554$; GFI = 0.862; AGFI = 0.811; NFI = 0.973; CFI = 0.986; SRMR = 0.0547

Table 2.
Items and factor loadings

Marker Technique (Williams *et al.*, 2010), borrowing the partial correlation technique suggested by Lindell and Whitney (2001). A post-hoc marker variable (i.e., education) was identified as not theoretically and empirically correlated with the latent constructs (Tanner and Kast, 2003). The comparison between the Method-C model and the Baseline model ($\Delta\chi^2 = 1.010$, $df = 1$, $p = 0.315$) proves the absence of method variance. Overall considering, CMB is not a significant concern in this study.

3.4 Measurement model fit

Borrowing the two-step approach of Anderson and Gerbing (1988) we first assessed the validity and reliability of the measurement model by the means of confirmatory factor

analysis (CFA) and then the constructs paths using the covariance-based structural equation modelling technique (CB-SEM). The robust maximum-likelihood method (RML) was used to execute both procedures to correct for possible normality assumption violation typical for the survey data-collection method. The empirical analysis was performed using the software Lisrel 8.80 (Jöreskog and Sörbom, 2006).

Results of the CFA are evaluated to assess the convergent and discriminant validity of measures (Hu and Bentler, 1999). The CFA shows a good model fit, as proved by indexes presented in Table 2. All items show a standardised factor loading higher than 0.6 (Hair et al., 2010). All items statistically load onto the expected latent constructs at a 99% significant level (t -values > 10). Measures for the Average Variance Extracted (AVE) and Composite Reliability (CR), presented in Table 3, confirm the convergent validity as higher than their cut-off values (AVE > 0.5 and CR > 0.7; Fornell and Larcker, 1981). Finally, using the Fornell and Larcker criterion (1981), the discriminant validity is assessed as the square root of AVE for each construct are found greater than the correlations for each construct in the relevant rows and columns (Table 3).

4. Structural model results

We implemented two structural models. Model 1 estimates direct and indirect effects between structural paths. Model 2 estimates the overall relationships between constructs, including the interaction effects. Both models show an appropriate predictive power for consumer purchase intentions for sustainable packaged food products being the R^2 higher than 0.7. Further, both models indicate a good model fit as proved by the model fit indexes presented in Table 4. Both χ^2 ratios, as lower than 3, evidence no specific problems of multicollinearity. Similarly, the incremental fit indexes (NFI and CFI) are higher than 0.95 in both models. The Goodness of Fit Index is higher than 0.80, confirming that the estimated model properly fit the hypothesised theoretical model. Finally, being the values for the Standardised Root Mean Square Residual lower than 0.8 no specific problems with the estimated residuals emerge.

The preference for sustainable retailers represents a direct driver of the intention to buy sustainable packaged food products, confirming our first hypothesis [H1: $\beta = 0.348$, t -value = 4.08]. Retailers promoting sustainable activities in-store, as well as in their communication to final customers have a relevant role in conditioning consumers preference for eco-friendly products. Further, also consumers' trust in sustainable producers results to be relevant in determining purchase intentions for sustainable packaged food products, as postulated in the second hypothesis [H2: $\beta = 0.229$, t -value = 4.34]. Specifically, in this case, results show that consumer involvement in searching for any label and logo showing an eco-friendly product influences their trust in sustainable producers and indirectly their purchase intentions, confirming the third hypothesis [H3: $\beta = 0.681$, t -value = 7.61]. The indirect effect

Scales	AVE	CR	Correlation matrix							
PI	0.728	0.941	0.853							
PRO	0.658	0.913	0.627	0.811						
RET	0.702	0.899	0.709	0.535	0.838					
EC	0.752	0.924	0.755	0.571	0.581	0.867				
LAB	0.572	0.799	0.754	0.549	0.545	0.562	0.756			
SEX	1.000	1.000	-0.228	-0.279	-0.199	-0.267	-0.133	1.000		
AGE	1.000	1.000	0.006	-0.205	-0.073	-0.050	0.083	0.253	1.000	
INC	1.000	1.000	0.037	-0.137	-0.032	-0.035	0.007	0.229	0.155	1.000

Note(s): The square root of the average variance extracted (AVE) and correlations between constructs (off-diagonal)

Table 3.
Correlation matrix and
Fornell and Larcker's
criterion

Models Direct effects	Model 1		Model 2		Consumers' pro- environmental purchase intentions	
	β	<i>t</i>	β	<i>t</i>		
<i>Main effects</i>						
Trust in sustainable producers → Purchase intentions	0.229***	4.34	0.209***	3.93	1321	
Preference for sustainable retailers → Purchase intentions	0.348***	4.08	0.364***	5.53		
Environmental Concern → Purchase intentions	0.444***	6.06	0.619***	5.42		
Consumer involvement in eco-friendly labels → Trust in sustainable producers	0.681***	7.61	0.678***	7.60		
<i>Control variables</i>						
Sex → Purchase intentions	-0.025	0.42	0.009	0.14		
Age → Purchase intentions	0.086*	2.16	0.068*	1.70		
Income → Purchase intentions	0.082*	2.05	0.084*	2.09		
<i>Interaction effects</i>						
Environmental Concern * Trust in sustainable producers → Purchase intentions			0.304*	1.78		
Environmental Concern * Preference for sustainable retailers → Purchase intentions			-0.117	0.66		
R^2 (Purchase intentions)		0.727		0.743		
ΔR^2				0.016		
$\chi^2_{S-B}(df)$	448.84 (190)		488.840(220)			
χ^2_{S-B}/df ratio		2.36		2.22		
Comparative Fit Index (CFI)		0.980		0.983		
Normed Fit Index (NFI)		0.966		0.970		
Goodness of Fit Index (GFI)		0.835		0.838		
Adjusted Goodness of Fit Index (AGFI)		0.780		0.779		
Standardized Root Mean Square Residual (SRMR)		0.066		0.064		
Note(s): * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$						

Table 4.
Results for the
structural equation
models

of eco-labels on the intention to purchase packaged food products is confirmed by the mediation analysis presented in Table 5. Thus, producers who want to encounter the growing target of consumers attentive to the purchase of sustainable packaged food products should carefully choose labels and logos that immediately highlight the green vocation of their offer.

Environmental concern represents a strong driver of the purchase intention for sustainable packaged food products, as postulated in H4a [H4a: $\beta = 0.444$, t -value = 6.06]. The opportunity to protect and preserve the environment by adopting sustainable behaviours, also buying sustainable packaged goods, is the main reason moving consumers to buy eco-friendly products. Furthermore, environmental concern is also able to improve the purchase intentions of sustainable packaged goods when consumers believe in the sustainable practices adopted by the producer, supporting H4c [H4c: $\beta = 0.304$, t -value = 1.78]. Conversely, environmental concern seems not playing a moderating role

	Standardized direct effect	Standardized indirect effect	Mediation result
Consumer involvement in eco-friendly labels → Trust in sustainable producers → Pro-environmental purchase intentions	0.415***	0.160***	Partial
Note(s): * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$			

Table 5.
Mediation test result

when the preference towards sustainable retailers and the purchase intentions for sustainable packaged goods path is concerned. Hypothesis H4b is then rejected.

Demographics included in the model as control variables give us more information about consumer purchase intentions for eco-friendly products. Results show a slight effect of income and age on consumer purchase intentions for sustainable packaged food products. As expected, older people with a higher income are more willing to buy eco-friendly products.

5. Discussion

5.1 Theoretical contribution

Findings foster theoretical insights on how to promote pro-environmental behaviours within consumers by the interaction of external and internal factors. The results evidence that consumer intentions to purchase sustainable packaged food products are directly driven by three factors. The latter includes consumer concerns over the environment – resulted as the main contributor to consumers' pro-environmental intentions. Accordingly, the current study confirms previous findings showing that environmental concern acts as the stronger influencer of consumer-sustainable motives (Newton *et al.*, 2015; Wei *et al.*, 2018) and purchase intentions (Hao *et al.*, 2019; Vermeir and Verbeke, 2006). Previous studies found that environmental claims can influence consumer willingness to buy eco-friendly products (Tanner and Kast, 2003), so our work extends this acknowledgement in the context of sustainable packaged food products. The second factor emerging in the study as a key driver of consumer sustainable food purchase intentions is the influence played by the retailer. Results confirm previous findings on the growing consumer attention on retailers' CSR policies towards reducing waste and adopting sustainable practices. Retailers sustainable practices are hereby confirmed to generate virtuous consumer behaviours, as evidenced by previous studies (Tsarenko *et al.*, 2013; Young *et al.*, 2018). Consumers prefer retailers who take a significant stance on protecting and being strongly committed to the environment, diminishing food waste (Perrini *et al.*, 2010; Young *et al.*, 2018). Similarly, findings are displaying that trust in sustainable producers has a positive impact on pro-environmental purchase intentions. Results confirm Hartmann and Apaolaza-Ibáñez's (2012) findings in the specific context of sustainable packaged food products. We also confirm that eco-labels, impacting on the image of sustainable producers, play a key role in enhancing purchase intentions for sustainable packaged food products, as stated by Testa *et al.* (2015) and Tanner and Kast (2003). As highlighted by Atkinson and Rosenthal (2014), the exclusive use of eco-labels is not sufficient to generate virtuous purchasing choices, if not expressly supported by producers' sustainable practices. Vice versa, food producers can reinforce the effect of their environment-friendly claims on consumer purchase intentions by using eco-labelling strategies for their food products. Furthermore, this study extends the empirical results of the pro-environmental consumer behaviour literature showing that environmental concern plays an amplifying role in the effect that trust in sustainable producers has on sustainable purchase intentions. From a theoretical perspective, on the one hand, the study confirms that environmental concern moderates consumer purchase intentions, as recently revealed by Cachero-Martínez (2020) and Tandon *et al.* (2020), and, on the other hand, opens up the debate on the interaction between internal and external factors when consumers' pro-environmental behaviours are concerned.

Finally, findings evidence that consumer purchase intentions for sustainable products are also driven by intrinsic factors such as demographics, confirming the results of Carrigan and Attalla (2001).

5.2 Managerial implications

Our findings are particularly useful to suppliers and retailers interested in satisfying the increasing consumers' request for environmental sustainability. Till now food suppliers and

retailers have been working on environmental issues favouring the search for efficiency in their operations and supply chains as part of their sustainability strategy (Sullivan and Gouldson, 2016), leaving room for improvement in their CSR strategies (Naidoo and Gasparatos, 2018). Now, they are increasingly requested to include their customers into this strategy and act together as a whole. Indeed, our findings prove that food producers and retailers are influential in addressing consumer purchase intentions toward sustainability. Nevertheless, previous research evidenced that food-chain operators are not so effective in rightly displaying their policies and actions in favour of the environment. As an example, they provide consumers with poor readable reports showing concretely their sustainable policies (Saber and Weber, 2019). To overcome this limit, Gielens *et al.* (2017) evidenced that retailers can play a key role in pushing the supply chain to become more sustainable, even if the time and efforts required to translate sustainability strategies to the market limits this move (Lehner, 2015). In doing so, retailers should improve their communication strategies, found as sometimes failing in impacting on consumer behaviours (Jones *et al.*, 2011). Based on our results, the environmental concern does not moderate the preference for sustainable retailers and consumers' pro-environmental purchase intentions, evidencing a gap in retailers' performance. Accordingly, following Jones *et al.*'s (2011) suggestions, when communicating with customers, retailers should jointly evidence their commercial and promotional activity, with their stronger environmentally-friendly commitment. Further, in their in-store daily practice, as well as along the operation and logistic process, they should show how they act in name of sustainability. This will return in both pro-environmental behaviours and a higher willingness to pay a premium price for sustainable products, impacting on the company's profits. Finally, the introduction of interactive screens in-store can improve consumer information about sustainable packaged foods or about sustainable processes adopted by operators of the food chain, contributing to supporting consumers' sustainable behaviours. This practice is increasingly suggested by recent researches in the retail literature (e.g., Jäger and Weber, 2020). Similarly, the creation of in-store sustainable food products corners may communicate consumers the retailer's higher commitment to sustainability.

Similarly, producers should carefully and coherently associate the use of eco-labels with other strategies (e.g., production processes with low environmental impact; diminishing the content of plastic in packaging; use of recyclable packaging; corporate communication policies strongly focused on creating acknowledgement on the producer's effort in lowering the impact of the production system on the environment) in order to improve sales and involve consumers to opt for the sustainable offer. The use of eco-labels is ineffective *per se* (Atkinson and Rosenthal, 2014), and in certain cases can produce negativities on sales. Today, consumers have a wider range of options to be informed on the practices adopted by producers and if they are sensitive to a specific topic, such as the environmental one, they use to look for information about the company's production processes. Accordingly, producers should, on one hand, be honest about the level of sustainability of their production, and, on the other hand, adopt sustainable practices to encounter the emerging trends in shopping and consumption. In support of this strategy, a massive use of virtual tours and augmented reality to let consumers experience the sustainable practices introduced in the production process can be somehow effective. Food producers can also use their ordinary communication channels for sustainable business programs, as they are effective in influencing consumer behaviour in general (Danaher and Rossiter, 2011).

Producers and retailers may also extend their cooperation over contextual factors that shape consumer attitudes towards sustainable packaged food products. Improving in-store atmospheric factors might increase the consumer choice for sustainable and locally produced food (Campbell and Fairhurst, 2016). Jointly planning and managing communication campaigns in-store can be another way to cooperate in stimulating eco-friendly intentions in shoppers.

Last but not least, Covid-19 has created new opportunities for producers and retailers as it has enhanced consumers' environmental concern. This resulted in an increase in sustainable and high-quality food purchases during the lockdown periods (Cachero-Martinez, 2020), the effect that will last longer in consumers shopping behaviours. Accordingly, producers and retailers should take advantage of this positive trend and more strongly than ever support their environmental policies in light of sustainability.

6. Conclusions

The paper sheds light on how the interaction of internal and external factors can jointly influence consumer purchase intentions for sustainable packaged foods. Despite the contribution of the present study to the pro-environmental consumer behaviour literature, some points that could be expanded in further studies are present. First, as showed in the literature, although we are aware that intention drives behaviour in consumer studies, our work was focused only on purchase intentions. Future studies might extend the results of our research by collecting market data on actual purchases of sustainable packaged foods by shoppers to better understand their purchase process. This might imply retailers and producers' involvement. Second, the study was focused on a unique country, Italy. Future surveys should include other countries in order to consider possible national cultural and business specificities. Third, the food literature presents demographic variables as possible moderators of food purchase intentions, while we considered them as control variables. Test the moderating role of age, sex and income might extend the study results. Fourth, we investigated the generic macro-category of sustainable packaged food products, while category-product specificities may vary the general model results. Further, the present study focuses on sustainability-conscious buyers. Future studies should extend present results by focusing on a widespread sample composed by grocery consumers without specific knowledge in sustainability and pro-environmental products. Actually, in the last years, and above all after the spread of Covid-19, there is a greater sensitivity towards the concept of environmental sustainability. Further, as a result of both European regulations and the movements in favour of conscious consumption, more and more consumers are trying to adopt a conscious and environmentally-friendly behaviour, also concerning their food purchasing and consumption. This study, for example, highlights that those who have a greater sensitivity towards the environment are also more attentive to the policies of manufacturers, while a gap in the impact of retailers' strategies has emerged, showing an area requiring an in-depth investigation. Future studies should also investigate the moderating role of environmental concern on the interpretation of eco-labels and on the willingness to pay a higher price for sustainable agri-food products respecting sustainable production procedures, in line with emerging results (De Canio and Martinelli, 2020).

ORCID iDs

Francesca De Canio  <http://orcid.org/0000-0003-4658-282X>

Elisa Martinelli  <http://orcid.org/0000-0002-7429-8829>

Emiro Endrighi  <http://orcid.org/0000-0002-1351-1921>

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Consumers' pro-
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Corresponding author

Francesca De Canio can be contacted at: francesca.decanio@unimore.it

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