Exploring the attitude towards the adoption of a sustainable diet: a cross-country comparison

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Abstract

Purpose – Understanding the determinants that influence consumers' attitude to adopt sustainable diets represents an important area of research to promote sustainable food consumption. The aim of this study is to investigate how (1) the individual openness to new foods (ONFs), (2) the involvement in food trends (IFTs) and (3) the social media use (SMU) can potentially impact the attitude towards the adoption of a sustainable diet (ATSD).

Design/methodology/approach – The authors conducted a structured survey in eight countries: Italy, Germany, Poland, USA, Brazil, Japan, Korea and China. The final sample of 5,501 individuals was analysed applying a structural equation model.

Findings – The main results show that attitude towards the ATSD is influenced differently by the antecedents investigated in each country. In particular, the ONF positively influences the ATSD only in Italy, USA and Germany. IFT positively influences the ATSD only in Italy, Poland and USA, while negatively in Germany. SMU has a positive influence on the ATSD only in Japan, USA and Germany, while a negative one in Brazil and Korea.

Originality/value – This study presents a cross-country comparison about the antecedents of attitude towards the ATSD, thus providing evidence for the need of ad hoc marketing strategies by companies and policies by institutions at single country level.

Keywords Consumer attitude, Sustainable diet, Innovation, Food trends, Social media, Cross-country comparison

Paper type Research paper

1. Introduction

Global transformation such as climate changes and pollution, social and geopolitical tensions have increased concerns on how we produce, transform and consume foods (Reisch *et al.*, 2013), pushing policymakers and food supply chains to propose new integrated agendas for a more sustainable food system (Willett *et al.*, 2019). The sustainable food concept is not new, have been often associated with organic, local, fair-trade and Mediterranean-diet food. However, more recently it had also been associated with a reduction of food waste and healthy eating (Barone *et al.*, 2019; Choudhary *et al.*, 2019; Kuttschreuter *et al.*, 2014), thus calling for attitude and practice changes from all the operators of the food supply chain (Moschitz *et al.*, 2021), no latter the consumers.

Consumers are asked to be willing to change their consumption habits, including accepting new foods and technologies, in order to adopt more sustainable diets (Vaterlaus *et al.*, 2015), i.e. "*those diets with low environmental impacts which contribute to food and nutrition security and*

*to healthy life for present and future generations. Sustainable diets are protective and respectful
of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable;
nutritionally adequate, safe and healthy; while optimizing natural and human resources*"
(Food and Agriculture Organization of the United Nations *et al.*, 2012, p. ix).

However, despite the increasing sensibilization derived from marketing campaigns (De
Groene and Dötsch-Klerk, 2020), new pricing strategies and packaging reformulation (Chandon
and Wansink, 2012), guidelines (Lazzarini *et al.*, 2018), changing consumers' current food
preferences and habits, which are the result of our culture, familiar habits and local heritage, is a
challenging task. How do people form their attitude towards a new eating consumption pattern?
Several factors can influence their attitude towards a new diet. A first aspect is related to
individual's intrinsic characteristics: some individuals are, for example, more curious than
others and are more attracted by novelties, such as in the case of innovation adoption (Rogers,
2003), even if food preferences may also be influenced by cultural traditions and consumption
context (Reisch *et al.*, 2013). A second aspect refers to external factors that might influence
individuals' behaviour as being particularly sensitive to new trends. Consumers may be highly
involved towards following new trends, as developed by a national or international celebrity
who could launch a product and influencing not only the purchasing intention (McCormick,
2016), but also the consumer consumption behaviour of that specific food (e.g. Boyland *et al.*,
2013). Finally, individuals are increasingly using social media to gather information and find
out other users' opinions and past experiences (Ayeh *et al.*, 2013; Hajli and Sims, 2015). Indeed,
many studies have shown that social media does influence behaviour towards sustainability
(Närvänen *et al.*, 2018; Pearson *et al.*, 2016; Simeone and Scarpato, 2020; Sogari *et al.*, 2017).

Furthermore, empirical evidence suggests that consumer attitudes and demand for food,
including sustainable (e.g. organic) or innovative food may differ widely across countries (Rana
and Paul, 2017). However, so far many consumer food studies have focused mainly on one single
country (Chan, 2001; Palmieri *et al.*, 2019; Pham *et al.*, 2019; Yazdanpanah and Forouzani, 2015) or
a comparison between only two countries (Balakrishnan and Foroudi, 2020). Therefore, there is a
call for a broader investigation considering the antecedents of consumers' attitudes towards
sustainable diet over multiple countries using the same survey protocol (i.e. measures). For
instance, the importance of focussing on multiple countries has been also recently highlighted by
the European and Social Economic Committee (EESC) with a 2019 report about the promotion of
healthy and sustainable diets in Europe (Schmidt, 2019). The EESC report highlights the
importance of considering cultural and geographical differences between and within Member
States to better adopt the Sustainable Dietary Guidelines, including sustainable farming
systems. In our study, we included countries from eight countries: Germany, Italy, Poland, Brazil,
USA, China, Japan and Korea. To our knowledge, studies measuring the "attitude towards the
adoption of a sustainable diet" using such multi-country approach are lacking.

The aim of this paper is to explore which factors influence a person's attitude towards
adopting a sustainable diet. In particular, the research questions posed are: (1) which role does
openness to new foods contribute to adopt a sustainable diet? (2) are individuals who are
inclined to use social media more open to adopting a sustainable diet?; (3) are individuals more
involved in following food trends be more willing to adopt a sustainable diet? and (4) how do
these relationships differ across countries? From a marketing and policy-making perspective,
answering these questions will help the development of *ad hoc* promotional campaigns in
terms of both content and means.

The paper is structured as follows. The next section provides a brief description of the
theoretical background, with a literature review about three individual-related factors,
namely the individuals' openness to new food, the involvement in food trends and the use of
social media. The third section describes the methodology and the regression model adopted.
The fourth section reports the results of our study. Conclusions summarize the theoretical
and managerial and policy implications of the study.

2. Theoretical background and conceptual model

Based on the theory of planned behaviour (TPB), which is a social-psychological model to understand and predict human behaviour (Ajzen, 1991, 2016), this study focuses on "the attitude towards the behaviour". This is one specific antecedent of the behavioural intention that influences the actual behaviour. The attitude towards the behaviour "*refers to the perceived positive or negative consequences of performing that behavior and the subjective values or evaluations of these consequences*" (Ajzen, 2016). This attitude may be influenced by several factors that could be related to the individual, such as his/her health consciousness, but also to the perceived barriers, such as high price of food (Palmieri *et al.*, 2019; Pham *et al.*, 2019).

In this paper, we focus on the "attitude towards the adoption of a sustainable diet", investigating three individual-related antecedents, namely: (1) the individual's openness to new foods; (2) the involvement in food trends and (3) the use of social media.

First, consumers differ in terms of their new foods openness level. There are people who are fascinated by new food trends and who tend to adopt them before others, which can be defined as "innovators" (Rogers, 2003). Understanding innovative consumers is important for marketing purposes since their identification could help food companies to investigate the reason behind the success of new innovations: innovative consumers tend to buy new foods before others, buy more new foods than their friends and purchase new food before tasting it, among the others (Huotilainen *et al.*, 2006). However, so far, few studies have been conducted to investigate how far consumers' openness to new foods influences the adoption of *sustainable* foods (e.g. Balakrishnan and Foroudi, 2020; Sogari *et al.*, 2021). For example, very recently, Sogari *et al.* (2021) have looked at the factors impacting the acceptance of a new and sustainable food (a blended meat-mushroom product) among a group of students. Their results show a significant and positive relationship between consumer's inclination towards food innovation and their purchase intention. Focussing on Italian consumers, Palmieri *et al.* (2019) noticed that curiosity towards new food experiences positively influences the willingness to eat insect-based food. In line with above mentioned research, we argue that:

H1. The openness to new foods positively influences the perception of sustainable diet

Second, individuals' perceptions can be influenced by food trends. Nowadays, several trends in the food industry can be identified. Some examples include the categories of functional foods (Santeramo *et al.*, 2018; Urala and Lähteenmäki, 2007), novel foods (Payne *et al.*, 2019), organic foods (Aertsens *et al.*, 2009) and sustainable foods (Bianchi and Mortimer, 2015). Studies in marketing have shown that people's behavioural processes are influenced by trend affinity (So *et al.*, 2018), referring to people who aim to follow trends, and novelty, that is rather linked to the degree to which consumers desire to experience new products (Manning *et al.*, 1995). Indeed, around the globe, there are several new food trends such as the flexitarian diet which is a plant-based diet with the occasional inclusion of animal products, i.e. semi-vegetarian diet (Sogari *et al.*, 2021), new food with insect-based ingredients (Palmieri *et al.*, 2019) and food with nanoparticles, either inside food or in packaging (Santeramo *et al.*, 2018). For example, thanks to nanotechnologies, there has been the introduction of edible packaging (Trajkovska Petkoska *et al.*, 2021). The positive influence of trends can also be derived from some recent experiments. Yang *et al.* (2020) looked at the introduction of a new, sustainable ingredient in a food snack, among a group of UK consumers who tasted both a sustainable-snack and a non-sustainable one. Their results show no difference in consumers' response in a blind condition, while once the consumers were informed that the snack was made with a sustainable ingredient, consumers had higher emotional response (e.g. consumers were less "guilty"). Therefore, we argue that:

H2. Involvement in food trends positively influences the attitude towards the adoption of a sustainable diet

Third, social media could be an important factor in explaining the attitude towards a certain behaviour since people are influenced by what others think and do (Simeone and Scarpato, 2020; Vaterlaus *et al.*, 2015). Social media are an important mean for communication (Kuttschreuter *et al.*, 2014) and allow people to share their experiences among friends, but also to unknown individuals. People tend to engage with social media for different reasons, from fun to sharing personal opinions to looking for peers or for a specific information about a specific product, brand and also place (Mangold and Faulds, 2009; Pearson *et al.*, 2016; Vaterlaus *et al.*, 2015). Increasingly, social media are used to gather information and understand peers' judgements about their own opinions. We find examples with respect to apparel (Zhao *et al.*, 2019), green products (Singh *et al.*, 2020; Sun and Wang, 2019), but also tourism (Ayeh *et al.*, 2013), thus suggesting that social media are important in several contexts. Previous studies have analysed, for example, the impact of social media engagement on the intention to purchase innovative food products, also finding country-level differences (Balakrishnan and Foroudi, 2020). Others have looked at the social media use on consumers' perception finding that social media has an impact on the individual's subjective norm (Sun and Wang, 2019) and also on attitudes (Zhao *et al.*, 2019). As Copeland and Zhao (2020) noted in their study about the use of Instagram by US consumers, "*social media use and perception is an important determining factor on ultimate purchase intention on social networks*" (p. 12).

Considering that there are multiple types of social media (Mangold and Faulds, 2009; Vaterlaus *et al.*, 2015), and not all of them are available in every country (e.g. Facebook and Twitter are banned in China–Zhao *et al.*, 2019), in our study we did not refer to any specific name.

Based on the above-mentioned studies, we suggest that:

H3. The social media use positively influences the attitude towards the adoption of a sustainable diet

The conceptual model and the hypotheses are further refined based on the country-level dimension. In fact, food habits are highly influenced by culture that shapes food decisions (Asp, 1999) and countries differ in terms of both food marketing and consumption (Shaw, 2014). For example, in some countries like Asia and Europe, eating is a social experience, whereas in some such as the US, it is a more individualistic experience (Lee and Ulgado, 1997). Furthermore, there are some studies showing that customers not only tend to perceive certain types of food in a different way across countries, but also within the same country. For example, a recent survey in Italy shows that Northern and Central regions differ from Southern and island regions with respect to their intention to buy sustainable foods (Vassallo *et al.*, 2016). Furthermore, the social media is used differently in several countries. For example, Goodrich and de Mooij (2014), moving from Hofstede's national culture values, notice that the use of social media differ across cultures such as in the cases of Italy, where the focus is more on selective friendship, and Brazil, where the social media is used for self-enhancement and consumer-to-consumer interactivity. This seems to suggest the importance of exploring individual's attitudes, including potential differences at a country level. Therefore, a fourth hypothesis is:

H4. To what extent hp1-hp3 differ across countries.

3. Materials and methods
In the following, we provide detailed information about data collection, measures and data analysis.

3.1 Data collection
Data were collected between June 2018 and July 2019 through online and face-to-face questionnaire (Rübsamen *et al.*, 2017; Wongprawmas *et al.*, 2021) over a convenience,

non-stratified sample of 5,501 individuals of which 746 from Brazil, 363 from China, 473 from Germany, 1,648 from Italy, 473 from Japan, 447 from Korea, 310 from Poland and 1,041 from USA These countries were chosen because they present different diet pattern and traditions. For example, Italy is well-known for the Mediterranean diet, which is known to be balanced and varied, including fruit and vegetables (Wongprawmas *et al.*, 2021), whereas Chinese dietary culture presents lot of soy food (Ren *et al.*, 2011) and Korean diet is characterized by lot of "*vegetables, moderate to high consumption of legumes and fish, and also by a low consumption of red meat*" (Kim *et al.*, 2016, p. 31). Table 1 reports socio-demographics statistics, namely age, gender, level of education and the level of income. Incomplete questionnaires were deleted whether there were missing values on any other variable than control variables. Participants were asked to provide consent to participate at the study before proceeding. The research has been performed in accordance with the Declaration of Helsinki. Each participant was informed about the definition of sustainable diet as defined by the Food and Agriculture Organization of the United Nations *et al.* (2012).

3.2 Measures

The original questionnaire was in English and then translated by professional translators for each country. The questionnaire comprises multiple sections based on attitude towards the adoption of a sustainable diet, openness to new foods, involvement in food trends and social media use. Finally, socio-demographic questions were asked.

The main dependent variable, *"Attitude Towards the Adoption of a Sustainable diet"* (ATSD), that was measured using a semantic differential scale through four items, i.e. "*Adopting a sustainable diet by me in the coming three months will be: (1) harmful-beneficial, (2) foolish-wise, (3) unnecessary-essential, (4) difficult-easy*".

The three independent variables were measured using multiple items each. Based on several authors (Barcellos *et al.*, 2009; Huotilainen *et al.*, 2006; Palmieri *et al.*, 2019; Sogari *et al.*, 2021), the *Openness to New Foods* (ONFs) is measured through a question about to what extent the interviewed agrees with six different statements: *"(1) I buy new, different or innovative foods before anyone else I know; (2) Generally I am amongst the first of my circle of friends to buy new, different or innovative foods; (3) Compared to my friends, I purchase more new, different or innovative foods; (4) If new, different or innovative foods are available in shops and supermarkets I always purchase them; (5) Generally I am the first amongst my friends to remember a brand of new, different or innovative foods; (6) I do purchase new, different or innovative foods even if I have not tasted/experienced them beforehand*".

The *Involvement in Food Trends* (IFTs) is newly developed. This is measured through a question about to what extent the participant agrees with three different statements: *"(1) New food trends are important for me; (2) I am always very curious about new food trends; (3) I am always fascinated by new food trends*".

Based on past studies (Bruwer and Wood, 2005; Chen *et al.*, 2011; Quinton and Harridge-March, 2008; Reyneke *et al.*, 2011; Thach, 2009; Wilson and Quinton, 2012), the *Social Media Use* (SMU) is measured through a question about to what extent the interviewed agrees with three different statements: "*(1) I use social media to obtain information on the types of diet; (2) I use social media to obtain information on new diets and new food trends; (3) I use social media to get to know others' opinions on diets and food trends*".

All the independent variables are measured using a five-point Likert scale, ranging from 1 – Strongly disagree to 5 – Strongly agree.

3.3 Data analysis

We used a structural equation modelling (SEM) technique (Hair *et al.*, 2009) to test for the model identified in Figure 1. STATA 15 software was used to conduct the SEM.

	Brazil (n = 746) (%)	China (n = 363) (%)	Germany (n = 473) (%)	Italy (n = 1,648) (%)	Japan (n = 473) (%)	Korea (n = 447) (%)	Poland (n = 310) (%)	USA (n = 1,041) (%)	Total (n = 5,501) (%)
Age									
18-24 y	20.6	73.6	41.6	26.3	77.0	41.4	29.4	9.7	32.6
25-34 y	35.8	25.3	49.9	32.1	21.1	43.6	26.1	15.6	30.2
35-44 y	24.3	1.1	7.0	12.9	1.9	5.1	21.9	20.0	13.4
45-54 y	11.3	0.0	1.1	15.4	0.0	4.3	14.2	19.3	11.0
55-65 y	4.8	0.0	0.2	10.1	0.0	2.9	7.7	15.9	7.4
Over 65 y	3.2	0.0	0.2	3.3	0.0	2.7	0.6	19.6	5.4
Gender									
Male	31.2	42.1	46.9	38.3	59.6	51.7	30.4	47.1	42.5
Female	68.8	57.9	53.1	61.7	40.4	48.3	69.6	52.9	57.5
Education									
Primary education	0.1	0.0	0.2	1.6	0.6	0.0	1.3	0.8	0.8
Middle school	12.2	2.8	1.3	5.5	0.6	0.0	1.9	0.6	3.9
Secondary education	53.9	15.4	23.0	41.3	34.0	55.3	23.2	29.1	36.9
Bachelor degree	20.0	74.9	52.4	22.5	63.0	32.4	20.0	48.5	37.2
Master/PhD degree	13.8	6.9	23.0	29.1	1.7	12.3	53.5	21.0	21.2
Income *									
Low	12.6	9.1	11.2	9.6	14.6	0.0	5.5	9.1	9.4
Low-medium	35.3	11.0	15.6	19.4	8.5	22.1	15.3	9.3	17.8
Medium	26.7	54.5	35.9	42.4	24.8	48.1	45.5	21.8	35.7
Medium-high	14.9	10.2	25.8	12.5	11.7	26.4	15.6	20.8	16.6
High	9.4	5.0	5.3	2.4	5.1	3.4	5.2	24.7	8.5
N/D	1.2	10.2	6.1	13.8	35.2	0.0	13.0	14.2	11.9

Note(s): * A total of 10 missing values (Italy, n = 1,642; Poland, n = 308; Japan, n = 471)

Table 1.
Socio-demographic
statistics

4. Results

Cronbach's alpha values are reported in Table 2, distinguishing for each country. As we can see from Table 2, all the values are higher than 0.7. Table 3 presents the correlation matrix, while Table 4 shows the mean of the dependent and independent variables at single country level.

Table 4 shows that participants have an average score of 3.857 out of 5 in terms of attitude towards a sustainable diet. In particular, Brazilian, Japanese and Chinese interviewees present values above the average, while Italian, Polish, Korean, American and German below the average. Therefore, it seems that Brazilian, Japanese and Chinese respondents are more willing to adopt a sustainable diet in the next three months than Italian, Polish, Korean, American and German respondents.

For what concerns the *ONFs*, Poland, Korea, China, USA and Germany present values above the average, while Italy, Japan and, in particular, Brazil are below it. It seems that there
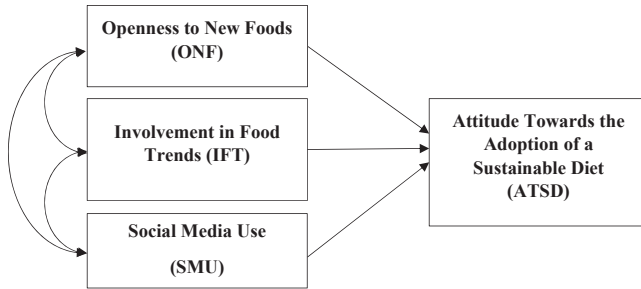

Figure 1.
Graphical
representation of the
conceptual model

Country	Attitude (ATSD)	Openness to new foods (ONFs)	Involvement in food trends (IFTs)	Social media use (SMU)
Brazil (*n* = 746)	0.711	0.975	0.940	0.956
China (*n* = 363)	0.832	0.911	0.726	0.717
Germany (*n* = 473)	0.703	0.851	0.752	0.782
Italy (*n* = 1,648)	0.765	0.944	0.932	0.930
Japan (*n* = 473)	0.702	0.926	0.883	0.901
Korea (*n* = 447)	0.735	0.924	0.818	0.863
Poland (*n* = 310)	0.746	0.926	0.892	0.935
USA (*n* = 1,041)	0.831	0.958	0.941	0.971
Total (5,501)	*0.775*	*0.952*	*0.915*	*0.935*

Table 2.
Cronbach's α internal
reliability

		[1]	[2]	[3]	[4]
[1]	ATSD	1.000			
[2]	ONF	0.046	1.000		
[3]	IFTs	0.090	0.569	1.000	
[4]	SMU	0.102	0.405	0.635	1.000
	Mean	3.857	2.674	2.798	2.838
	St. Dev	0.788	1.102	1.143	1.275

Note(s): Correlation coefficients greater than 0.046 in absolute value are statistically significant at 99%

Table 3.
Correlation matrix of
the constructs

is a lot of heterogeneity in terms of individual *ONFs*, with some countries like Germany, China and Korea that present very high scores (3.243 and 3.214 and 3.127, respectively). Brazilian respondents, instead, score the lowest (1.758). *IFT* presents an average of 2.798, with all countries above the average, but Italy and Brazil. Finally, Japan, Korea, China and Germany present higher value than the average for the *SMU* variable.

Table 5 shows the results of the SEM. First, an adequate model fit is obtained with CFI > 0.90 and the RMSEA < 0.08, is present for all the countries, but Brazil (with RMSEA = 0.104). Based on the model results, we see that all the three antecedents influence the ATSD, but their impact differs across countries. In particular, the *ONF* positively influences the attitude of adopting a sustainable diet (Hp 1) only in some countries, i.e. Italy, USA and Germany. Therefore, hypothesis 1, i.e. people who reported a greater *ONF* have a higher *ATSD*, is partially supported. As we can see, the highest value is reported for German respondents ($\beta = 0.115$, $p < 0.05$), followed by US ($\beta = 0.098$, $p < 0.05$) and Italian respondents ($\beta = 0.075$, $p < 0.05$).

The fact that *IFT* positively influences the *ATSD* is true only in Italy, Poland and USA, while it has a significant and negative effect in Germany. Our results show that the highest impact is for Polish respondents ($\beta = 0.231$, $p < 0.05$), followed by USA ($\beta = 0.140$, $p < 0.001$) and Italian ones ($\beta = 0.091$, $p < 0.05$). Surprisingly, the *IFTs* construct in Germany has a negative impact compared to the other European countries. One explanation could be that some countries have already adopted a sustainable diet to a higher extent than others and therefore the involvement in new food trends could impact differently. For example, a recent study shows that about 50% of German consumers have already adopted a more sustainable diet with respect to the environment, including vegetarian, flexitarian, vegan and pescatarian (Koptyug, 2021). Another explanation could be related to the different food neophobia level in each country that could result from aversion, danger and disgust (Santeramo *et al.*, 2018). For instance, even if a person is highly involved towards new food trends, he/she could be reluctant towards specific new foods that are perceived as disgusting. This could be the case of edible insects. For instance, Orsi *et al.* (2019) showed that neophobia has a negative influence on accepting insect products among German consumers.

Finally, the *SMU* positively influences the *ATSD* only in Japan, USA and Germany, while it has a negative and significant influence in Brazil and Korea. Table 5 reports the highest value for Japan ($\beta = 0.170$, $p < 0.001$), followed by Germany ($\beta = 0.154$, $p < 0.05$), and USA ($\beta = 0.047$, $p < 0.1$), while Brazil and Korea present negative values ($\beta = -0.049$ and -0.071 respectively, $p < 0.1$). It is possible that these different results derive from the type of social media used by companies and consumers, and the country-level policies. There are, in fact, several social media that could be used by companies in different ways (Kaplan and Haenlein, 2010). We think that this could also influence consumers' *ATSD*, and we recommend that future research investigates the different types of social media used by consumers and how

Country	ATSD	ONFs	IFTs	SMU
Brazil ($n = 746$)	4.427	1.758	1.970	2.171
China ($n = 363$)	4.019	3.214	3.335	3.646
Germany ($n = 473$)	3.527	3.243	3.173	3.162
Italy ($n = 1,648$)	3.741	2.498	2.620	2.834
Japan ($n = 473$)	3.959	2.643	3.183	3.419
Korea ($n = 447$)	3.838	3.127	3.177	3.177
Poland ($n = 310$)	3.612	2.750	3.023	3.177
USA ($n = 1,041$)	3.758	2.958	2.910	2.385
Total (5,501)	*3.857*	*2.674*	*2.798*	*2.838*
Note(s): 5-point Likert scale, ranging from 1 – Strongly disagree to 5 – Strongly agree				

Table 4.
Mean value for each measure-single country

	Brazil (n = 746)	China (n = 363)	Germany (n = 473)	Italy (n = 1,648)	Japan (n = 473)	Korea (n = 447)	Poland (n = 310)	USA (n = 1,041)
ATSD								
← ONFs	−0.021	0.043	0.115**	0.075**	−0.025	0.021	0.005	0.098**
← IFTs	0.028	−0.001	−0.104*	0.091**	0.029	−0.008	0.231**	0.140***
← SMU	−0.049*	0.063	0.154**	−0.002	0.170***	−0.071*	0.083	0.047*
χ^2	865.044	88.055	133.587**	857.089***	213.941***	118.463***	207.398***	581.053***
RMSEA	0.104	0.000	0.029	0.069	0.051	0.023	0.061	0.070
CFI	0.948	1.000	0.983	0.964	0.976	0.993	0.968	0.974
SRMR	0.048	0.030	0.032	0.055	0.061	0.027	0.051	0.076

Note(s): *$p < 0.1$; **$p < 0.05$; ***$p < 0.001$

Table 5.
Path model towards
attitude towards
sustainable diet:
standardized
coefficients and
p-values

each type affects the attitude towards a sustainable diet. Similarly, also companies and retailers could communicate via social media in different ways across countries. For example, a recent study on retailers' use of Twitter, has highlighted the importance of social media for targeting consumers and the need of identifying multi-channel social media communication mix (Samoggia *et al.*, 2019). Furthermore, the role of institutions is important in influencing eating behaviour since they may sponsor or ban the use of social media as well as adopting tariffs or incentives for certain types of foods. None of the expected relationships are significant, either positively or negatively, in China.

5. Discussions and conclusions

Understanding which factors are important in determining the attitude towards a sustainable diet represents a first step towards a more sustainable food consumption. Our results provide first empirical insights on three individual-level antecedents, namely the *ONFs*, the *IFTs* and the *SMU*, while the results show that these factors affect the *ATSD* differently across countries. Our four hypotheses were partially supported. More precisely the *ONF* positively influences the *ATSD* only in Italy, USA and Germany. *IFT* positively influences the *ATSD* only in Italy, Poland and USA, while negatively in Germany. This could also be explained by the fact that Poland is quite influenced by Italian cuisine (Smiglak-Krajewska and Wojciechowska-Solis, 2021) and, therefore, there might be an "imitation" effect. Furthermore, it could be that these results are driven by the socio-demographic characteristics of the sample, where only 1.5% of all Germany respondents are above 45 years. *SMU* has a positive influence on the *ATSD* only in Japan, USA and Germany, while a negative one in Brazil and Korea.

From the data analysed, and based on our three antecedents, we could arrange a rank of countries that are, more or less, ready to develop an *ATSD*. It seems that countries such as the USA, Italy and also Germany (where there is a negative effect of the food trends) could be the ones where campaigns on sustainable diets could have a higher effect. Similarly, it is particularly important to identify other antecedents for China, where none of our antecedents has been found as significant in influencing the ATSD.

In the following, we describe theoretical and managerial implications, with the limitation of the study, its strengths and future research directions.

5.1 Theoretical implications

From a theoretical point of view, this paper advances extant research in a twofold way. First, it disentangles the impact of three individual-level antecedents of the *ATSD*, thus shedding light on the importance of considering the very first factors that could influence "attitude towards behaviour", that in turns influence "behavioural intention" and, eventually, the "actual behaviour" (Ajzen, 1991, 2016). Second, the cross-countries analysis conducted also fills the call for the need of studies that "*explore consumers' attitudes towards novel and functional foods, and in particular, [...]in Countries for which consumers' attitudes and preferences are still weakly investigated*" (Santeramo *et al.*, 2018, p. 44), the role of social media in the consumers' acculturation process towards sustainable food (Choudhary *et al.*, 2019; Sogari *et al.*, 2017), and the emotional drivers, as represented by our new scale related to the involvement in food trends, that influence consumers to engage more in sustainable food (Yang *et al.*, 2020). In particular, the fact that the hypothesized relationships differ across countries, call for additional research that considers local peculiarities.

5.2 Managerial and policy implications

Our results show that there is a lot of heterogeneity across countries and that there is no "one variable that fits all" solution. As a result, each country should leverage on specific marketing tools to encourage people towards more sustainable diets. For example, the negative effect that the *SMU* has on the *ATSD* in Brazil and Korea might lead companies and the public authority

to carefully monitor what is reported on the web. Additionally, based on previous studies as over Brazilian consumers (Barone *et al.*, 2019), we think that future studies should also make more explicit what sustainable diet means across multiple segments of the population. Moreover, our results seem to support the need of managers to "think global, act local": in an increasing globalized world, countries still present several differences that could be justified by their demography, the sensibility towards international food scandals and the value attached to eating in general (Lee and Ulgado, 1997). Fairly, recent research has shown that consumers are very heterogeneous regarding eating habits also within a specific country (Laureti and Benedetti, 2018; Wongprawmas *et al.*, 2021). Besides demographics, further studies should include multiple factors that could influence attitude such as, knowledge and information seeking, and context (Feldmann and Hamm, 2015). Furthermore, our study also enriches previous studies about sustainable food purchases that have looked to "external" drivers, such as eco-labels and guidelines (Lazzarini *et al.*, 2018), providing evidence about how individual-related factors are important for developing attitudes towards sustainable diets.

Sustainable diets are the new frontier that could help both the planet and our communities by protecting the environment and improving human health. However, beyond having new solutions from the supply side, we need to understand which are those factors that change individual's food habits and attitudes if we want to reach a sustainable diet at large scale. Consumers need to be informed towards more sustainable food habits and in so, doing, understanding which are those factors that could help, are important from a social, beyond environmental perspective. We think that the three antecedents identified could represent an important first step for both companies and policymakers in order to address the challenge of a worldwide sustainable diet adoption, as also put forward by the Sustainable Development Goals (Ahmed *et al.*, 2020).

5.3 Limitations, strengths and further research

Our study is not without limitation. First, we are aware that sample size is not representative and therefore results should be carefully considered and avoid generalization. Second, the hypothetical nature of the study (e.g. self-reported measure) cannot allow testing whether the attitude will determine actual behaviour. Third, we are aware that there are several possible scales that could be adopted when measuring "sustainable diet" (Eme *et al.*, 2019; Tepper *et al.*, 2021).

Nevertheless, the main strengths are several. First, we include novel measures that represent a good starting point also for other researchers interested in understanding an individual's attitude towards a sustainable diet. Second, our analysis includes several countries, thus representing, to the best of authors' knowledge, one of the few contributions worldwide as comparing eight countries. Consequently, we encourage future studies to include the behavioural intention and the actual purchasing behaviour towards sustainable food. Finally, we recommend future studies to select a stratified sample in terms of socio-demographic characteristics to allow a better and more accurate cross-country comparison.

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