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## Sustainable food consumption across Western and Non-Western cultures: A scoping review considering the theory of planned behaviour

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### ABSTRACT

The theory of planned behaviour (TPB) states that food consumption is preceded by an intention, which is shaped by behavioural beliefs and attitudes. To mitigate criticism of the TPB's lack of cultural context, researchers have tested extended models with culturally specific variables included. This scoping review maps the use of the extended TPB across Western and Non-Western cultures in the context of sustainable food consumption, which includes meat consumption, food waste and organic food purchases. 3924 abstracts and 241 articles were screened. The final review included 95 articles. The number of Western and Non-Western studies was similar, but sample sizes were larger in Western cultures. Generally, the inclusion of culturally specific variables improved models that predicted organic food purchases and food waste, but not for meat consumption. The current findings highlight a lack of consensus regarding the selection of culturally specific variables. Instead, future cross-cultural research that explores similar factors could facilitate the development of a universal model of sustainable food. This model is required to drive a global approach towards encouraging sustainable diets. Incorporating cultural nuances and targeting common core values and attitudes may improve generalisability and efficacy of subsequent interventions that target sustainable food consumption across cultures.

## 1. Introduction

### 1.1. Background literature

A sustainable diet is a dietary pattern that promotes health and wellbeing, produces low environmental pressures, is accessible, affordable, safe, and culturally acceptable (WHO & FAO, 2019). Our diets can be more sustainable by, for example, eating a vegan or vegetarian diet, reducing food waste, eating seasonally, purchasing organic products and consuming lower carbon meats (Ivanova et al., 2020). However, dietary change can be challenging, especially when food choices are motivated by a range of factors, such as self-enhancement or tradition (Hoek et al., 2021).

Indeed, a plethora of theories have been developed to understand and facilitate behaviour change including with respect to diet (Timlin et al., 2020). One example of a behaviour change theory is the theory of planned behaviour (TPB), which has been widely applied in the food sustainability literature (Ajzen, 2015; Contini et al., 2020; Leonidou

et al., 2022; Malavalli et al., 2021; Pandey et al., 2021; Paul et al., 2016; Scalco et al., 2017; Yazdanpanah & Forouzani, 2015; Yuriev et al., 2020). The theory suggests that behaviour change depends on our intentions, which forms our motivational state (Ajzen, 1991). Intentions are informed by three beliefs: attitudes, perceived behavioural control (PBC), and subjective norms.

However, the TPB has been criticised for potentially overlooking cultural differences (Sniehotta et al., 2014; Trafimow, 2015). Culture is important because it informs behavioural norms for various eating behaviours that are relayed across generations (Alonso et al., 2018; Mascarello et al., 2020; Wijaya, 2019). Acknowledging this, many researchers have extended the TPB to include specific variables that were likely to be relevant within the cultural context that they were testing (henceforth referred to as 'culturally specific variable'), such as individual responsibility (Kumar, 2019) perceived consumer effectiveness (Taufique & Vaithianathan, 2018), food neophobia (Bakr et al., 2023) and environmental concern (Adel et al., 2022).

Nonetheless, the selection and application of culturally specific

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variables has been inconsistent across studies. Here we propose a scoping review of studies which have used the TPB or an extended version in the context of sustainable eating. A scoping review can be used as a precursor to a systematic review, in order to identify key factors related to a concept and identify knowledge gaps (Munn et al., 2018). A number of previous systematic reviews exist in this area which have considered sustainable food behaviours and the TPB. For example, Biasini et al. (2023) reported that culture and acculturation were important for dietary change across qualitative studies. However, it is notable that in this review dietary change was examined through the lens of health rather than environmental concern. Furthermore, Yuriev et al. (2020) reported what variables were added to the TPB (i.e., moral norm, past behaviour, self-identity, habit, self-efficacy), but cultural context was not considered. These reviews have identified how the TPB has been applied to a range of sustainable behaviours but examining cultural patterns was not their specific aim. Therefore, our scoping review will add to the literature by providing a synthesis of a breadth of evidence that examines potential cross-cultural similarities and differences in variables used to extend the TPB.

In the current review, culture is operationalised using the cultural dimension theory (Hofstede, 2010). This theory indicates distinct differences between individualist and collectivist societies, also conceptualised as Western and Non-Western cultures. For instance, Western cultures emphasize the individual's interests over the group's interests. Whereas the opposite occurs in Non-Western cultures. Moreover, in psychology in general, there is an overrepresentation of samples that are Western, educated, industrialised, rich, and democratic, also known as "WEIRD" (Henrich et al., 2010). Indeed, a previous survey of the most prestigious American psychology journals reported that only three percent of participants were from Asia, and less than one percent were from Africa or the middle East (Arnett, 2008). Consequently, research findings are likely to be less generalisable to other countries and cultures (Apicella et al., 2020). Furthermore, a recent paper summarised sustainability insights from Non-Weird countries (Wooliscroft & Ko, 2023). Their findings indicated that applying "WEIRD" solutions to other countries is likely to be unsuccessful, as the factors that drive sustainable consumption are specific to the cultural context. Considering this, the aim of this scoping review was to firstly, identify the extent to which the TPB has been applied to Western and Non-Western cultures to explain sustainable food consumption intentions and secondly, to map the culturally specific variables most frequently added to the TPB and the most important drivers of sustainable food consumption.

## 2. Method

In accordance with Arksey and O'Malley (2005), we (1) identified the research question, (2) identified the relevant studies, (3) selected the appropriate studies, (4) charted the data and (5) collated and reported the results. The Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist (Tricco et al., 2018) guided the research process (See the [supplementary materials](#), S1 for a checklist). The review protocol was preregistered via the Open Science Framework (OSF) prior to the literature search (<https://osf.io/yu753/>).

### 2.1. Identifying the research question

The research question was developed using the PICOC framework, which stands for population, intervention, comparison, outcome, and context (Booth et al., 2019). For our scoping review, we considered how the theory of planned behaviour (context) has been applied in Western and Non-Western cultures (population) to understand consumer's intentions (outcome) to engage in environmentally sustainable food consumption (intervention). The inclusion and exclusion criteria are available in the [supplementary materials](#) (see [supplementary materials](#), S2).

### 2.2. Identifying the relevant studies

In line with the JBI scoping review manuals (Peters et al., 2020), the search strategy was developed through the recommended three stages. The key terms "theory of planned behavior" and "sustainable eating" were searched in the ProQuest and Medline database. However, articles that included the TPB in titles or abstracts were limited. Accordingly, the TPB was replaced with "consumer intentions" and related concepts to broaden the search. Suitable titles and abstracts were examined, and additional words were identified (see [supplementary materials](#), S3). The final search was conducted on the 25th of January 2022 with the updated key terms. Finally, the reference lists of relevant papers were examined to highlight additional search terms. The search strategy for ProQuest psychology is presented in the [supplementary materials](#) (S4). On the 27th of July 2023, the literature search was updated.

### 2.3. Reference management

Retrieved references were imported into EndNote (<https://endnote.com>). The reference list was organised by the author and title name to identify duplicate articles. Furthermore, references were ordered by publication year to remove articles published before 2002. Prior to this date, research in climate psychology was scarce (Haunschild et al., 2016). Finally, references were imported to the web-based review software Covidence where duplicate articles were removed automatically (<https://www.covidence.org>).

### 2.4. Study selection

Prior to screening, the reviewers (T. R & A. C.) discussed the title and abstract screening process. This included the software navigation and eligibility criteria. Covidence presents articles on a screen where reviewers can provide each study with a vote (i.e., yes, no, maybe). Articles voted "yes" or "maybe" progressed to the "full text review section." Articles voted "no" moved to the "irrelevant" section. If contrasting votes occurred, the article moved to the "resolve conflicts" section. To reduce bias, Covidence conceals the reviewer's original vote. Articles in this section were discussed until a unanimous vote was decided. If a consensus was not reached, a third reviewer (L.W.) made the final decision. The agreement rate between reviewers for the title and abstract screening was 95.3 %, Kappa = 0.66. Based on recommendations from Landis and Koch (1977), the agreement rate was substantial. This was repeated for full text screening. However, the "maybe" vote was removed, so reviewers either included or excluded articles. Excluded articles required a reason from a pre-established list. Exclusion reasons were modified during the full text review to create broader categories of exclusion. Conflicting votes were discussed until a unanimous decision was agreed. The full text agreement rate was 88.3 %, Kappa = 0.69.

### 2.5. Charting the data

The components of the data charting table were discussed by the authors to determine the study characteristics of interest, including the citation details, country of origin, the study purpose and design, the methodology used, the intervention type, key findings, and cultural characteristics of participants. The individualism and collectivism continuum from Hofstede's (2001) theory of cultural dimensions was used to confirm participants' cultural background as Western or Non-Western. For instance, countries that scored lower than 48 on the individualism dimension were categorised as Non-Western. The data charting was tested in Covidence for five full text articles by two reviewers (T. R & A. C.) to ensure that sufficient details of each study were captured. The remaining articles were charted by the main author (T. R.).

## 2.6. Collating the results

The extracted data was exported from Covidence into a single spreadsheet on Microsoft Excel. Numerical study characteristics were calculated which included the percentage of studies that measured attitudes, subjective norms, PBC, intentions and behaviour (i.e., the full TPB model). The percentage of studies that reported participants' ethnicity was calculated and tables were created to display the distribution of male and female participants across Western and Non-Western cultures. Furthermore, a geographical map was created on MapChart (<https://www.mapchart.net>) to highlight the prevalence of studies across countries. A narrative synthesis was conducted on the extracted data to 1) explore the application of the TPB to predict sustainable food choice intentions; 2) compare the TPB application across Western and Non-Western studies; 3) identify the key factors that influenced sustainable food consumption; 4) examine the information reported about participants.

## 3. Results

### 3.1. Literature search

Across the selected databases, 5637 articles were exported to Covidence. 4281 title and abstracts were screened after duplicate articles were removed (See [Figure 1](#)). The full text of 303 articles were screened. The final review contained 95 articles. See the [supplementary materials](#) for the full characteristics of included studies.

### 3.2. Study characteristics

The reviewed articles were published between 2004 and 2023; 51 % were published in the last two years (See [Table 1](#)). Studies were equally represented across Western (48.2 %) and Non-Western cultures (51.8 %). Three sustainable food-related behaviours were considered: food waste, meat consumption and organic foods. Studies on food waste targeted the selection and consumption of products at restaurants (e.g., excessive food ordering), home (e.g., reducing, and separating food waste) and supermarkets (e.g., abnormally shaped fruit and vegetable

**Table 1**

General characteristics of the included studies.

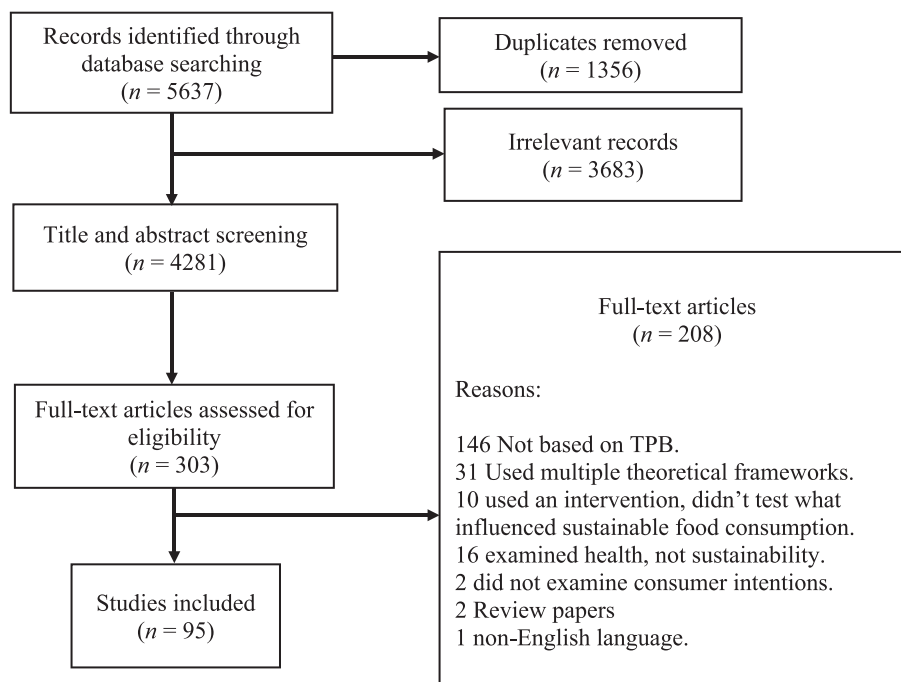
Study Characteristics (N = 95)	n	%
Year of publication		
2004–2016	16	16.8
2017–2020	27	28.4
2021–2023	52	54.7
Cultural demographic		
Western	40	42.1
Non-Western	51	53.7
Western and Non-Western	4	4.2
Target behaviour		
Food waste	37	38.9
Meat consumption	19	20
Sustainable/organic food purchases	39	41.1
Ethnicity reported?		
Yes	6	6.3
No	89	93.7

purchases). Studies on meat considered many approaches to reduce consumption, such as eating a plant-based diet, offal, and insect consumption, and reducing red and processed meat. Studies on organic food focused on general purchases, whereas some studies focused on specific foods (i.e., tomatoes, vegetables, apples, ready-made pizza).

### 3.3. Cultural characteristics

The total sample for the reviewed studies was 67,246 participants (see [Table 2](#)). Approximately half (57.8 %) of participants were from a Western culture. 61.4 % of the overall sample were female.

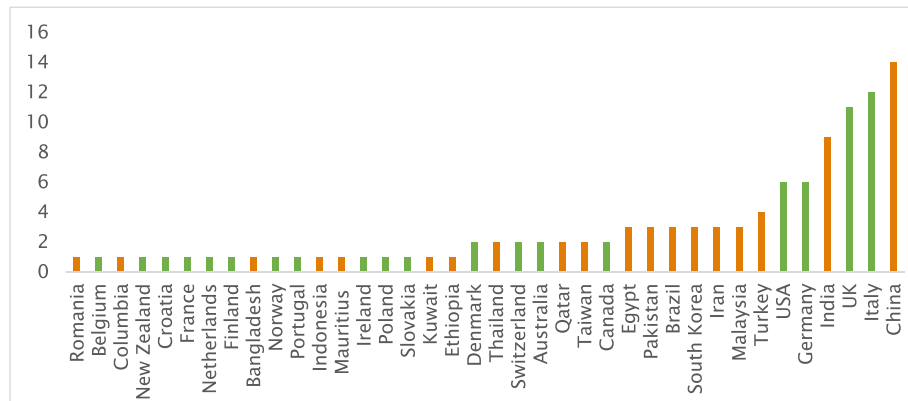
The country that conducted the most studies was China ( $n = 14$ ). This was followed by Italy, the UK, Germany, and the USA (See [Figure 2](#)). 12 studies researched participants across multiple cultures or countries (Adel et al., 2022., Arvola et al., 2008; Asif et al., 2018; Bakr et al., 2023; Boobalan et al., 2021; Boobalan et al., 2022; Borusiak et al., 2022; Gallgher et al., 2022; Neubig et al., 2020; Roseira et al., 2022; Watanabe et al., 2021; Wolstenholme et al. (2021)). See [Figure 3](#) for a



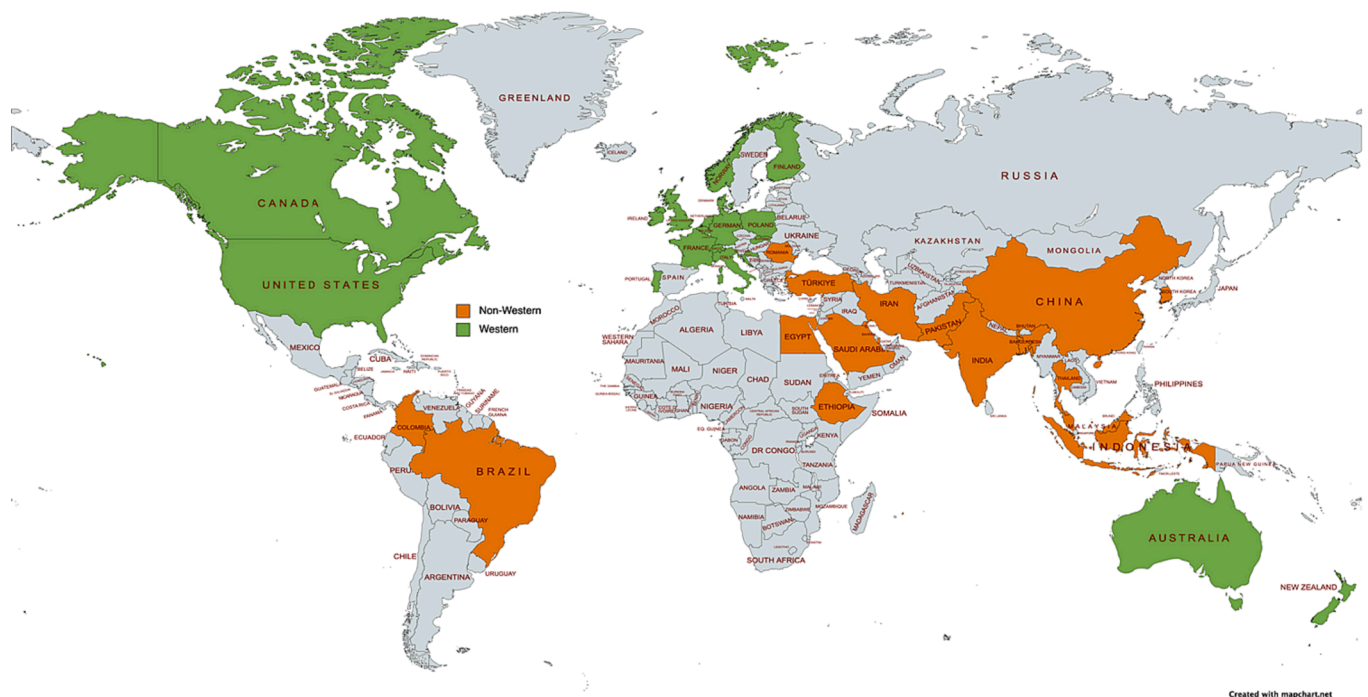
**Fig. 1.** PRISMA flowchart detailing the review process, including the number of articles retrieved and the number of articles excluded at each stage.

**Table 2**  
Gender distribution of participants across Western and Non-Western cultures.

	Male		Female		Not reported		Non-binary		Total	
	n	%	n	%	n	%	n	%	n	%
Western	13,366	19.9	25,449	37.8	49	0.07	9	0.01	38,873	57.8
Non-Western	11,776	17.5	15,842	23.6	751	1.12	4	0.01	28,373	42.2
Total	25,142	37.4	41,291	61.4	800	1.2	13	0.02	67,246	100



**Fig. 2.** The number of studies conducted across countries.



**Fig. 3.** A map highlighting the geographical distribution of studies.

geographical distribution of studies. The green areas represent Western cultures, and the orange areas represent Non-Western cultures. Participants' ethnicity was reported in six studies (Bretter et al., 2022; Karim Ghani et al., 2013; Graham-Rowe et al., 2015; Lentz et al., 2018; Oehman et al., 2022; Reid et al., 2018).

Studies on food waste (59.5 %) and organic food purchases (61.5 %) were mainly conducted in non-Western cultures. Alternatively, studies on meat consumption were mainly conducted in Western cultures (73.7 %).

### 3.4. Measurement of the TPB variables

Attitudes (95.8 %), subjective norms (89.5 %) and PBC (88.4 %) were measured predictors of intentions in most studies. Of the 95 reviewed studies, 44 included a behavioural component. Behaviour was measured through self-reported methods in almost all studies. Only three studies objectively measured behaviour (Lorenz et al., 2017; Menozzi et al., 2017; Testa et al., 2019). For example, Menozzi et al. (2017) measured intentions to eat a cookie made with insect flour. Behaviour was determined by whether participants returned to the lab

after a month, and then consumed the insect cookie. The adjusted R-squared values indicated that the TPB accounted for 77.8 % of the variance in intentions. Whereas intentions explained 18.7 % of the variance in whether the participant ate the insect cookie. Lorenz et al. (2017) measured food waste in a university canteen whereby two independent reviewers coded pictures of students' plates. The model accounted for 48.8 % of the variance in student's intentions to finish their food at lunch. Whereas portion size, intention and palatability accounted for 16.2 % of the variance in actual food wasted. Finally, Testa et al. (2019) examined supermarket data for over 30 months to monitor organic food purchases of customers who were enrolled in a loyalty card program. The variance predicted by the overall model was 64 %. The next section reports the key themes that underpin the TPB application in the reviewed studies. We note that because so few studies report observable behaviour, for brevity, we use the term 'behaviour' to describe 'self-reported behaviour' in the remainder of this article, unless explicitly indicated otherwise.

### 3.5. Theme 1: Testing the original TPB

25 studies tested the original TPB model (Aktas et al., 2018; Carfora et al., 2020; Chen & Antonelli, 2020; Chen, 2021; Çoker & van der Linden, 2020; Coşkun & Filimonau, 2021; Dean et al., 2012; De Gavelle et al., 2019; Graham-Rowe et al., 2015; Heidari et al., 2020; Lentz et al., 2018; Menozzi et al., 2017; Nair, 2021; Ng et al., 2021; Oehman et al., 2022; Qi & Ploeger, 2019; Qi et al., 2023; Rees et al., 2018; Seffen & Dohle, 2023; Schmidt, 2019; Soorani & Ahmadvand, 2019; Wolstenholme et al., 2021; Wyker & Davison, 2010; Yadav & Pathak, 2016; Yu et al., 2021).

According to the adjusted R-squared values, the variance in intentions accounted by the TPB ranged from 26 % – 77.8 % for Western cultures (Lentz et al., 2018; Menozzi et al., 2017) and 17 % – 77 % for Non-Western studies (Chen, 2021; Soorani & Ahmadvand, 2019). This implies that the predictive ability of the TPB is highly variable across cultures when applied to sustainable food consumption intentions. Of the studies that measured behaviour ( $n = 11$ ), the variance ranged between 8.8 % – 40 % for Western cultures (Sultan et al., 2020; Rees et al., 2018), and 13 % – 46 % for Non-Western cultures (Coşkun & Filimonau, 2021; Yu et al., 2021). One qualitative study used the TPB as a framework for thematic analysis (Drolet-Labelle et al., 2023). Health benefits, good taste and protecting the environment were perceived advantages of eating plant-based protein foods (i.e., attitudes). Family members were frequently reported as people who would both approve and disapprove of plant-based foods (i.e., subjective norms). Finally, a lack of motivation to change consumption patterns and not knowing how to prepare plant-based proteins were perceived barriers (i.e., PBC).

#### 3.5.1. Theme 2: Testing an extended version of the TPB

85 studies extended the TPB. Additional variables were tested as predictors of intentions, along with the TPB variables. See the [supplementary materials](#) for a conceptual model of extended variables (S5). Both Western and Non-Western studies reported that culturally specific variables significantly predicted intentions and behaviour. For example, a study in Turkey reported that guilt had a strong influence on intentions to reduce food waste (Aydin & Aydin, 2022). Furthermore, personal norms influenced intentions to reduce meat consumption in participants from Poland and Slovakia (Borusiak et al., 2022). Despite this, culturally specific variables were not always significant predictors. For instance, organic food purchase intentions were not influenced by e-WOM (i.e., consumers' willingness to share and talk about their experience with others on social media) or health consciousness (Zayed et al., 2022). Also, intentions to buy plant-based yoghurt were not predicted by objective knowledge of plant based-yoghurt (e.g., plant-based yoghurts have similar nutritional values to dairy yoghurt) or perceived barriers to purchase (Pandey et al., 2021).

Nevertheless, studies that tested both the original and extended TPB

( $n = 18$ ) reported that the addition of culturally specific variables improved the predictive ability of models by 19 % on average, based on the percentage change in adjusted R-squared values. Similarly, the adjusted R-squared values of extended models were variable across Western and non-Western cultures, ranging between 29.2 % – 87 % (Ham et al., 2018; Pandey et al., 2021) and 13.7 % – 83 %, respectively (Karim Ghani et al., 2013; Qi & Ploeger, 2019).

Health consciousness, personal norms, self-identity, and environmental concern were common extended variables across cultures. Eight Non-Western (Adel et al., 2022; Asif et al., 2018; Bakr, Al-Bloushi, & Mostafa, 2023; Bhutto et al., 2022; Dinc-Cavlak & Ozdemir, 2022; Qi et al., 2023; Yadav & Pathak, 2016; Zayed et al., 2022) and five Western studies (Bakr et al., 2023; Michaelidou & Hassan, 2008; Roseira et al., 2022; Smith & Paladino, 2010; Testa et al., 2019) included health consciousness. Four studies across cultures reported that health consciousness was the third most important predictor of intentions to buy organic food (Qi et al., 2023; Yadav & Pathak, 2016; Roseira et al., 2022; Smith & Paladino, 2010). Furthermore, a study in China reported that health consciousness was the most important predictor of organic food purchase intentions (Bhutto et al., 2022). Alternatively, two studies in Egypt (Zayed et al., 2022) and Scotland (Michaelidou & Hassan, 2008) did not report any significant effects. Finally, two studies in Turkey (Dinc-Cavlak & Ozdemir, 2022) and Italy (Testa et al., 2019) reported that health consciousness significantly influenced attitudes towards organic food. Whereas a study with participants from Canada and Kuwait reported that health consciousness did not influence attitudes towards plant-based meat alternatives.

Six Western studies (Borusiak et al., 2022; Moser, 2015; Neubig et al., 2020; Schmidt, 2019; Stöckli & Dorn, 2021; Visschers et al., 2016) and one Non-Western study (Elhoushy & Jang, 2021) included personal norms in extended models. Most of these studies considered food waste. Across cultures, these studies reported that personal norms were the most important predictor of intentions to reduce food waste (Elhoushy & Jang, 2021) and intentions to buy abnormally shaped fruit and vegetables (Neubig et al., 2020). Similarly, two studies in Germany (Moser, 2015) and Switzerland (Visschers et al., 2016) reported personal norms as the second most influential predictor of intentions to reduce food waste and willingness to eat expired food to prevent food waste. Personal norms differ from subjective norms as the individual's moral perception guides behaviour as opposed to the (dis)approval of a behaviour from significant others.

Self-identity was mostly studied in Western cultures (Carfora et al., 2017; Graham-Rowe et al., 2015; Michaelidou & Hassan, 2008), especially in the UK (Dean et al., 2012; Reid et al., 2018; Wolstenholme et al., 2021). Two Non-Western studies in China and Ethiopia included self-identity (Abu Hatab et al., 2022; Bhutto et al., 2022; ). Self-identity was expressed differently across behaviours. For example, meat-eater identity and self-identity (e.g., "I think of myself as a green consumer") were expected to influence intentions to reduce meat or purchase organic food. Findings from Italy and the UK on the significance of the meat-eater identity were mixed (Carfora et al., 2017; Wolstenholme et al., 2021). Whereas self-identity significantly predicted intentions to reduce food waste (Graham-Rowe et al., 2015; Reid et al., 2018) and purchase organic food (Dean et al., 2012; Michaelidou & Hassan, 2008). Another aspect was the good provider identity. People with this identity were motivated to provide a variety of food for guests, so would excessively buy and prepare food in anticipation. Like the meat-eater identity, the significance of the good provider identity was mixed across cultures (Barone et al., 2019; Mejia et al., 2021). One Non-Western study examined food waste during Ramadan, a religious holiday that alters regular eating routines (Aktas et al., 2018). During Ramadan, higher social engagement (e.g., receiving more visitors at home) was related to excessive supermarket food purchases. Furthermore, food purchases were positively related to reported food waste. In contrast, the good provider identity did not significantly influence intentions to reduce food waste in Colombia, also a Non-Western culture

(Mejia et al., 2021). Although, this study was conducted during the Covid-19 lockdown, a time where social interactions were prohibited.

Environmental concerns were included in Non-Western cultures for organic food purchases (Ahmed et al., 2021; Asif et al., 2018; Jiang & Wu, 2022; Kirmani et al., 2023; Siraj et al., 2022; Smith & Paladino, 2010; Yadav & Pathak, 2016; Zayed et al., 2022) and food waste (Adel et al., 2022; Lin & Guan, 2021; Ng et al., 2021; Tsai et al., 2020). Generally, environmental concerns positively influenced organic food purchase intentions, especially in China, Egypt and India (Ahmed et al., 2021; Jiang & Wu, 2022; Siraj et al., 2022; Yadav & Pathak, 2016; Zayed et al., 2022). Although, some studies reported no significant effects on organic purchases (Asif et al., 2018; Smith & Paladino, 2010; or food waste intentions (Tsai et al., 2020). For meat consumption, participants from Canada, Kuwait and India reported that their attitudes towards vegan products were significantly influenced by their environmental concerns (Bakr et al., 2023; Malik & Jindal, 2022).

Apart from environmental concerns and health consciousness, the selection and significance of extended variables in Non-Western cultures was variable. For instance, mindfulness, face consciousness, group conformity (Qi & Ploeger, 2019; Qi et al., 2023), activism (Elhoushy & Jang, 2021), and drive for environmental responsibility, (Tewari et al., 2022) were significant predictors of intentions. Alternatively, collectivist culture (Kirmani et al., 2023; Najib et al., 2022; Zahra et al., 2022), perceived consumer effectiveness (Lin & Guan, 2021; Matharu et al., 2021; Siraj et al., 2022), and trust (Mughal et al., 2023; Nuttavuthisit & Thøgersen, 2017; Suh et al., 2015) displayed mixed results.

Unique variables were also apparent in Western cultures, but to a lesser extent for. For example, uniqueness seeking lifestyle was the strongest predictor of organic food purchase intentions (Ham et al., 2018). Also, ambivalence significantly influenced meat reduction intentions (Berndsen & Pligt, 2004). Furthermore, yuck factor significantly influenced intentions to separate food waste (Oehman et al., 2022) Alternatively, habit (Çoker & van der Linden 2020) or perceived importance (Reid et al., 2018) did not influence intentions.

### 3.5.2. Theme 3: The use of mediators and moderators within the TPB

Some studies predicted that extended variables influenced the TPB variables or moderated relationship between the TPB variables and intentions. Mediating variables were applied in seven Non-Western studies (Ahmed et al., 2021; Ashraf et al., 2019; Dinc-Cavlak & Ozdemir, 2022; Dorce et al., 2021; Jiang & Wu, 2022; Nautiyal & Lal, 2022; Tewari et al., 2022) and five Western studies (Canova et al., 2020a,b; Gundala & Singh, 2021; Michaelidou & Hassan, 2008; Smith & Paladino, 2010; Sultan et al., 2020) on organic food purchases, two Western (Seffen & Dohle, 2023; Wolstenholme et al., 2021) and one Non-Western study (Zahra et al., 2022) on meat consumption and eight Non-Western studies (Adel et al., 2022; Chang et al., 2022; Elhoushy & Jang, 2021; Heidari et al., 2020; Jia et al., 2022; Liao et al., 2018; Lin & Guan, 2021; Ng et al., 2021) and one Western study (Gallagher et al., 2022) on food waste. Many extended variables were predicted to influence intentions indirectly through the TPB variables. For instance, attitudes partially mediated the relationship between collectivist culture and sustainable meat consumption intentions for participants from Pakistan (Zahra et al., 2022). Also, attitudes partially mediated the relationship between face saving (i.e., a person's judgement of their place in the social network), group conformity (i.e., perceived group pressures to maintain a group norm) and intentions to take home leftovers from restaurants (Liao et al., 2018),

Nine studies from Non-Western (Ahmed et al., 2021; Asif et al., 2018; Chekima et al., 2019; Dinc-Cavlak & Ozdemir, 2022; Dorce et al., 2021; Elhoushy & Jang, 2021; Govindan et al., 2022; Hwang & Kim, 2021; Nautiyal & Lal, 2022) and two studies from Western cultures explored extended variables as moderators (Berndsen & Pligt, 2004; Sultan et al., 2020). Moderating variables were tested to understand how much they strengthened or diminished the relationships between predictive variables and intentions. Most of these studies focused on organic food

consumption. For Malaysian consumers the relationship between products specific attitudes, willingness to pay and organic food consumption was moderated by future orientation (Chekima et al., 2019). Therefore, the extent that one anticipates future consequences before acting enhances the effect of product-specific attitudes and willingness to pay for organic foods. Additionally, a significant moderator across cultures was trust. For example, increased trust strengthened the relationship between intentions and organic food purchases (Dinc-Cavlak & Ozdemir, 2022; Sultan et al., 2020). Finally, Boobalan et al. (2021) used a novel approach that tested countries as moderators. For instance, the relationship between warm glow and organic food attitudes was stronger for Indian consumers, whereas the relationship between attitudes and intentions was stronger for American consumers.

Considering meat intake, ambivalence (i.e., having mixed or contradictory feelings) did not moderate the relationship between attitudes and intentions to reduce meat (Berndsen & Pligt, 2004). In contrast, a Non-Western study reported that product knowledge moderated the relationship between subjective norms and intentions to use insect restaurants (Hwang & Kim, 2021). However, no moderation was found for sustainable attitudes, PBC and intentions.

For food waste, a study in Egypt tested PBC as a moderator of the relationships between attitudes, injunctive norms, descriptive norms, and food waste reduction intentions, but found no significant effects (Elhoushy & Jang, 2021). In contrast, a study in China reported that infrastructure (e.g., the government provides sufficient facilities for food waste disposal), economic incentive and assistance (e.g., the volunteers provide me enough information on how to sort waste) positively moderated the relationship between intentions and food waste separating behaviour.

### 3.6. The comparison of original and extended TPB

The reviewed studies indicated that an extended TPB model explained a higher variance in intentions across food waste and organic food purchases. Whereas the original TPB explained a higher variance in intentions to reduce meat consumption. (See Table 3). According to the mean adjusted R-Squared values, the original and extended TPB most accurately predicted organic food purchase intentions.

#### 3.6.1. Cross-cultural differences

As previously mentioned, 12 studies tested different cultures and countries to examine the generalisability of extended models (see Section 3.3). The following sections will consider the studies that compared different (e.g., Western and Non-Western) and similar cultures (e.g., two Western samples).

Four studies compared Western and Non-Western samples (Bakr et al., 2023; Boobalan et al., 2021; Boobalan et al., 2022; Watanabe et al., 2021). Cultural differences were apparent for the drivers of intentions to buy plant-based meat alternatives (Bakr et al., 2023). For instance, attitudes influenced intentions more in the Canadian sample,

**Table 3**

Mean adjusted R-Squared percentages for intentions to perform target behaviours (i.e., not performance of the behaviour, either observable or self-report) across the original and extended TPB model.

	Mean adjusted R-Squared value (%)	SD	Mean adjusted R-Squared value (%)	SD
	Original TPB		Extended TPB	
Food waste (N = 9)	48.33	17.26	Food waste (N = 27)	52.07 16.18
Meat reduction (N = 9)	53.2	16.14	Meat reduction (N = 16)	50.83 15.98
Organic food purchases (N = 8)	53.6	14.08	Organic food purchases (N = 28)	61.43 10.58

but PBC was more important for participants from Kuwait. Models that predicted food waste intentions explained a similar variance for Brazil and the USA (61 %, 55 %, respectively). In both samples, PBC was the most important predictor of intentions, and both countries were not influenced by affective attitudes (i.e., having leftovers makes me feel happy/unhappy). Although, the American participants were influenced more by cognitive attitudes, and the Brazilian participants were influenced more by subjective norms (Watanabe et al., 2021). Two studies by Boobalan et al. (2021, 2022) compared participants from the USA and India. The earlier study reported little difference in variance in intentions to buy organic food (USA: 55 %, India: 52). However, across all comparisons, the relationship between the extended variable warm glow and the key TPB variables was significantly stronger for participants from India. The latter study reported that attitudes influenced self-reported organic food purchases the most in both cultures. Nevertheless, American participants were influenced more by PBC, whereas Indian participants were influenced more by subjective norms.

Eight studies compared different countries with similar cultural backgrounds (Adel et al., 2022; Arvola et al., 2008; Asif et al., 2018; Borusiak et al., 2022; Gallagher et al., 2022; Neubig et al., 2020; Roseira et al., 2022; Wolstenholme et al., 2021). For suboptimal food purchases (i.e., food products that do not meet specific cosmetic appearances), the extended model explained approximately 10 % more of the variance in intentions for Egypt when compared to China (Adel et al., 2022). Similarly, attitudes influenced intentions the most and both countries were not influenced by PBC. Arvola et al. (2008) reported differences in intentions to buy organic foods (i.e., apples, pizza) across Western cultures. The model best predicted intentions to buy organic apples in Italy (74 %), the UK (65 %) and then Finland (51 %). For organic ready-made pizzas, Italy was still best represented by the model (64 %), followed by Finland (56 %) and the UK (45 %). Across countries, there were differences in the importance of predictive factors. For instance, the Italian sample was influenced most by general and moral attitudes towards organic food, but not influenced by subjective norms. Alternatively, UK participants were influenced most by subjective norms for organic apples, but subjective norms did not influence organic pizza purchases. Finally, participants from Finland were influenced most by subjective norms when purchasing organic apples and pizza, but not influenced by moral attitudes. Asif et al. (2018) also highlighted differences across Non-Western cultures. The model that explained the most variance in intentions to buy organic was reported in Pakistan (81 %), Turkey (71 %), then Iran (68 %). All countries were influenced by different factors. For example, attitudes influenced intentions the most in Pakistan, subjective norms for Turkey, and health consciousness for Iran. To summarise, these results indicate that extended models are applicable to many cultures and countries, but there are subtle cross-cultural differences in the factors that influence intentions. Also, the importance of factors varies according to the target behaviour. The next section explores the overall drivers of sustainable food consumption intentions.

### 3.7. The overall driver so of sustainable food consumption

Generally, the main TPB variables were key influencers of consumers intentions to consume sustainably. The following paragraphs will explain the cultural differences for the application of these variables.

#### 3.7.1. Attitudes

Irrespective of culture, attitudes were a key factor that influenced intentions to make sustainable food choices. Of the 95 reviewed studies, attitudes were the most important predictor of intentions for 47 studies. Participants with more positive attitudes reported greater intentions. For example, intentions to follow a plant-based diet increased when positive attitudes towards a plant-based diet also increased (Wyker and Davison., 2010).

Particularly, attitudes was an important driver of organic food purchase intentions (Arvola et al., 2008; Asif et al., 2018; Boobalan et al.,

2021; Boobalan et al., 2022; Canova et al., 2020a,b; Chekima et al., 2019; Chen, 2020; Dinc-Cavlak & Ozdemir, 2022; Dorce et al., 2021; Gundala & Singh, 2021; Michaelidou & Hassan, 2008; Mughal et al., 2023; Najib et al., 2022; Nautiyal & Lal, 2022; Nuttavuthisit & Thøgersen, 2017; Qi & Ploeger, 2019; Qi et al., 2023; Roseira et al., 2022; Smith & Paladino, 2010; Siraj et al., 2022; Sultan et al., 2020; Testa et al., 2019; Vassallo et al., 2016; Wongsachia et al., 2022; Zayed et al., 2022). 17 out of 26 Non-Western and 14 out of 17 Western studies reported attitudes as the most important driver of organic food purchase intentions. Our synthesis suggests there is more variation across Non-Western cultures. For instance, studies in India, Turkey and China found that subjective norms were more important than attitudes (Asif et al., 2018; Jiang & Wu, 2022; Matharu et al., 2021). Likewise, studies in India and Bangladesh reported that attitudes were not as important as PBC when predicting organic food purchase intentions (Ashraf et al., 2019; Tewari et al., 2022). In addition, attitudes did not influence organic intentions in three Non-Western studies Non (Checkkima et al., 2019; Elhoushy & Jang, 2021; Moser, 2015). Interestingly, Chekima et al. (2019) found that product specific attitudes were significant predictors of organic food purchase intentions, but environmental attitudes were not significant. However, these participants were frequent purchasers of organic foods. This implies that general attitudes may influence behavioural intention, but other factors may prevail for maintaining organic food purchases.

**3.7.1.1. PBC.** PBC was the most influential factor of intentions for 18 studies across Western and Non-Western cultures, particularly for food waste (Abu Hatab et al., 2022; Ashraf et al., 2019; Carfora et al., 2017; Chang et al., 2022; Chen, 2021; Coşkun & Filimonau, 2021; Deliberador et al., 2023; Govindan et al., 2022; Liao et al., 2018; Lorenz et al., 2017; Nair, 2021; Oehman et al., 2022; Schmidt, 2019; Soorani & Ahmadvand, 2019; Tewari et al., 2022; Watanabe et al., 2021). For example, intentions to reduce waste were higher when American and Brazilian participants believed that eating the food served to them in a restaurant was easy (Watanabe et al., 2021). Likewise, Chinese consumers had lower intentions of taking restaurant leftovers home if they believed that preparing meals were difficulty (Liao et al., 2018). In contrast, seven food waste studies reported that PBC was not a significant predictor. Instead of general food waste, these studies focused on related behaviours, such as intentions to separate food waste (Karim Ghani et al., 2013; Ng et al., 2021) and intentions to use expiry date labels to determine whether food should be discarded (Thompson et al., 2020). Three studies on general food waste also reported no significant effect of PBC (Bretter et al., 2022; Mejia et al., 2021; Stancu et al., 2016).

As well as informing intentions, PBC was the best predictor of behaviour across six studies conducted in Western (De Gavelle et al., 2019; Gallagher et al., 2022; Stancu et al., 2016; Sultan et al., 2020) and Non-Western countries (Aydin & Aydin, 2022; Ashraf et al., 2019; Coşkun & Filimonau, 2021; Jia et al., 2022; Soorani & Ahmadvand, 2019). Similarly, PBC significantly influenced engagement in self-reported food waste (Aydin & Aydin, 2022; Aktas et al., 2018; Mejia et al., 2021; Nair, 2021; Palmieri & Palmieri, 2022; Visschers et al., 2016; Yu et al., 2021), self-reported organic food purchases (Dorce et al., 2021; Jiang & Wu, 2022; Nuttavuthisit & Thøgersen, 2017; Vassallo et al., 2016) and both objective and self-reported meat reduction (Menozzi et al., 2017; Rees et al., 2018). The evidence suggests the impact of PBC was higher for Western cultures. However, most Non-Western studies did not include a behavioural measure which indicates uncertainty on cultural differences regarding the impact of PBC on behaviour.

**3.7.1.2. Subjective norms.** Subjective norms best predicted intentions in three Non-Western studies on organic food purchases (Asif et al., 2018; Boobalan et al., 2021; Matharu et al., 2021) and two Western studies on organic fruit and ready-made pizza purchases (Arvola et al., 2008; Dean

et al., 2012). Generally, subjective norms were significant predictors of intentions for more than half of reviewed studies. For example, studies across cultures reported that subjective norms significantly influenced intentions to purchase organic food (Chu et al., 2023; Gungaphul et al., 2022) and reduce food waste (Heidari et al., 2020; Ng et al., 2021; Schmidt, 2019; Yu et al., 2021). However, two Non-Western studies reported that subjective norms did not influence food waste reduction (Coşkun & Filimonau, 2021; Nair, 2021). Considering meat consumption, six Western (Carfora et al., 2020; De Gavelle et al., 2019; Sabbagh et al., 2023; Seffen et al., 2023; Wolstenholme et al., 2021; Wyker & Davison, 2010) and two Non-Western studies reported that subjective norms had the second highest influence on intentions to reduce meat consumption (Bakr et al., 2023; Chen, 2021). Although, two Non-Western studies reported no significant effects for the influence of intentions to reduce meat (Lentz et al., 2018; Rees et al., 2018). This indicates that subjective norms may be more important to Western cultures in the context of reducing meat consumption. Although, the lack studies on meat consumption in Non-Western cultures indicates uncertainty.

Compared to the other TPB factors, subjective norms were the least important predictor for 21 studies across both cultures (Aktas et al., 2018; Barone et al., 2019; Borusiak et al., 2022; Canova et al., 2020a,b; Chang et al., 2022; Çoker & van der Linden, 2020; Deliberador et al., 2023; Dinc-Cavlak & Ozdemir, 2022; Dorce et al., 2021; De Gavelle et al., 2019; Graham-Rowe et al., 2015; Jia et al., 2022; Kirmani et al., 2023; Lorenz et al., 2017; Ng et al., 2021; Rees et al., 2018; Soorani & Ahmadvand, 2019; Sultan et al., 2020; Testa et al., 2019; Vassallo et al., 2016; Watanabe et al., 2021). Our synthesis indicates that subjective norms are not as important as attitudes or PBC, although Western cultures may be influenced by subjective norms more than Non-Western cultures, especially for organic food purchases and potentially meat consumption. Considering the modified concepts of subjective norms, Stancu et al. (2016) reported that injunctive norms were the most important predictors of intentions to reduce food waste. Alternatively, Stöckli & Dorn (2021) reported that only descriptive norms significantly predicted intentions to buy abnormally shaped fruit and vegetables. Finally, the remaining studies reported that both types of norms did not influence intentions to reduce food waste (Elhoushy & Jang, 2021; Graham-Rowe et al., 2015).

#### 4. Discussion

This scoping review explored the application of the TPB and extended versions of the TPB across Western and Non-Western cultures to understand the factors that drive sustainable food consumption. 95 articles were reviewed that considered food waste, organic food purchases and meat consumption. Three themes were explored: Testing the original TPB, testing an extended version of the TPB, and the use of mediators and moderators within the TPB. The variables most frequently added to the TPB were health consciousness, environmental concerns, personal norms, and self-identity.

Across Western and Non-Western cultures, extended TPB models explained more of the variance in intentions than the original TPB for food waste and organic food purchase intentions. Alternatively, the original TPB better predicted intentions to reduce meat. However, we acknowledge that substantially fewer studies were available that considered the original TPB. Based on our findings, the extent that extended models improved the predictive ability of the TPB cannot be assumed. Instead, it is likely that future studies should sequentially test both models to produce more evidence. Furthermore, this could be clarified by future studies in a systematic review or meta-analysis. Using this methodology will enable a rigorous examination of extended TPB models. Therefore, it can be determined whether extended models are significantly better predictors of sustainable food consumption intentions with the inclusion of culture.

Cross-cultural comparisons indicated that original and extended

models were suitable to predict behaviour across Western and Non-Western cultures. Although, there were subtle cultural differences across factors that most influenced intentions. Also, there was differences across cultures for the selection of culturally specific variables. Western cultures mostly considered personal norms and self-identity, whereas Non-Western cultures mostly included environmental concerns and health consciousness. Another systematic review on pro-environmental behaviours (i.e., traveling and commuting, energy saving, recycling) also found that moral norms, past behaviour, and self-identity were most frequently added to the TPB for Western countries (Yuriev et al., 2020).

However, it is unclear whether these factors (i.e., personal norms, self-identity) are applicable to a Non-Western culture, or whether environmental concerns are important to Western cultures. More cross-cultural research is required to examine whether extended factors are generally applicable, or to provide evidence for cultural differences. These practices align with the recommendation that TPB extensions are based on empirical evidence that are applicable to many behaviours (Ajzen, 2020).

Of the reviewed behaviours, extended models most accurately predicted intentions to purchase organic food, reduce food waste, then meat consumption. However, this comparison requires caution as meat consumption studies were considerably lower (20 %) than organic food (41.1 %) and food waste (38.9 %). This is an interesting observation considering the potential impact on greenhouse gas emissions. For example, organic farming uses less energy, but emissions are similar to conventional methods (Clark & Tilman, 2017). Furthermore, it is well known that meat produces substantial emissions (Sabaté et al., 2015), yet this behaviour was underrepresented in the current review, especially for Non-Western countries (26.3 %). This suggests sustainable food behaviours are prioritised differently across cultures. Future studies should address this gap and consider the most impactful sustainable food behaviours. This is necessary to challenge beliefs held by consumers that there is no link between the consumers' food choices and environmental sustainability (van Bussel et al., 2022).

The original TPB predicted intentions and behaviour similarly across cultures. Behaviour was measured in 46.3 % of studies which is still higher than other systematic reviews in this domain (Sok et al., 2021). Nevertheless, the current review highlighted that behaviour was not measured as much as the other TPB variables (i.e., attitudes, subjective norms, PBC, intentions). Furthermore, only 3.2 % used objective behavioural measures in the current review. Evidence suggests that self-reported measures are less reliable than objective measures. For instance, compared to the food waste collected from people's homes (i.e., an objective measure), participants underestimated their self-reported food waste (van der Werf et al., 2020). Also, a previous review concluded that self-reported organic food consumption was potentially influenced by socially desirable answers (Cerri & Testa, 2019).

The observation that self-reported measures are dominating research activity, has also been made in other psychological disciplines. (Baumeister et al., 2007; Gneezy, 2017; Otterbring et al., 2020; Simester, 2017). Indeed, these researchers highlight that behaviour is not understood by asking participants how they believe they would behave. Instead, field experiments can provide ecologically valid findings that inform researchers of the factors that influence actual behaviour objectively. Furthermore, field experiments can establish whether theoretical frameworks apply to behaviour outside of the lab. Therefore, future studies could investigate the extent of the intention-behaviour gap in real life decisions about sustainable foods. If a gap exists, research could explore what factors are necessary to bridge the gap between intention and behaviour and the applicability of these factors to other cultures.

In the current review, only 6.3 % of studies reported the ethnicity of their participants.

A recent systematic review highlighted that dietary intake of fruit



and vegetables, meat and eggs and influences on food choices varied across different ethnic groups who lived in the same country (Bennett et al., 2022). The generalisability of findings could be limited if this information is not provided. Consequently, future studies should aim to recruit diverse populations across cultures to thoroughly examine the presence of cultural differences. For instance, it is unknown whether Asian groups from Non-Western cultures are influenced by the same factors as Asian groups from Western cultures. Exploring these nuances across cultures and ethnic groups is important to develop a comprehensive model of sustainable food consumption.

Moreover, in line with the observation that studies from psychology are “WEIRD”, participants from WEIRD societies were also initially overrepresented here, with 72 % of participants sampled from Western cultures. However, our updated literature search included articles published from February 2022 to July 2023, and in this timeframe, the number of studies from Non-Western cultures had nearly doubled, from 27 in the first search, to 51 in the updated search. This meant that the representation of participants across cultures became more balanced (see Table 2). Nevertheless, studies conducted in Western cultures typically recruited a higher number of participants. Therefore, over half of the reviewed sample were from Western cultures (57.8 %). The increased representation from Non-Western cultures highlights the popularity of the theory of planned behaviour, despite criticisms of the lack of cultural consideration. This is attributable to the flexibility of the theory. Indeed, the addition of culturally specific variables has facilitated the application of the TPB to more diverse populations.

Another knowledge gap considers how the TPB is reported in studies. Broadly, the TPB was not explicitly referenced in all articles, despite using the theory or related aspects. This was reflected in the limited results of the initial search strategy. Of the 95 reviewed articles, 27 referred to the TPB in the title and 18 articles did not mention use of the TPB in the abstract (Abu Hatab et al., 2022; Asif et al., 2018; Berndsen & Pliigt, 2004; Chekima et al., 2019; Elhoushy & Jang, 2021; Gundala & Singh, 2021; Jia et al., 2022; Liao et al., 2018; Lorenz et al., 2017; Malik & Jindal, 2022; Michaelidou & Hassan, 2008; Najib et al., 2022; Nuttavuthisit & Thøgersen, 2017; Stefan et al., 2013; Stöckli & Dorn, 2021; Testa et al., 2019; Tewari et al., 2022; Tsai et al., 2020). Considering this, researchers should explicitly reference the theoretical foundations for behavioural models.

Furthermore, 19 % of studies did not include the key TPB variables in their model (i.e., attitudes, PBC, subjective norms). This was 11 % lower than another systematic review on sustainable farming motivations (Sok et al., 2021). Excluding key elements of a theory in favour of novel factors is problematic because it prevents the identification of core principles (Borghi & Fini, 2019). Therefore, future studies should examine all theoretical concepts to provide an accurate assessment of the TPB. Maintaining theoretical perspectives throughout articles is necessary to reinforce the broad aim of this research, which is to explain why consumers engage in sustainable food consumption and why cultural differences may occur, instead of focusing solely on the identification of novel factors.

Despite the prominence of the TPB in the food sustainability literature, other theories have been applied to sustainable food behaviours. In the COM-B model, cultural norms are represented through social opportunities (Michie et al., 2011). For instance, Chinese consumer's purchases of meat alternatives was best predicted by having support from family and friends (Jiang & Farag, 2023). However, reliance on social norms may not provide a comprehensive account of cultural differences, as studies have shown that cultures vary in their adoption and tolerance of social norms (Gelfand et al., 2011). Therefore, it is important to consider additional facets of culture such as religious beliefs, values associated with the preparation and disposal of food, acceptance of traditional foods and the media's portrayal of sustainable foods (Roudsari et al., 2017). Alternatively, Chen and Antonelli (2020) considers these factors within an extended food choice framework. This framework was applied in a recent study that considered attitudes

towards lab-grown chicken and beef (Padilha et al., 2022). However, the cultural aspects of this framework were not considered, only product and person-related factors. Therefore, more research is needed to assess the appropriateness of this framework for understanding the influence of cultural factors on sustainable food behaviours.

Finally, it was notable that studies in the current review used survey responses to statistically predict whether attitudes, subjective norms and PBC influenced intentions which in turn predicted behaviour. Sussman and Gifford (2018) provide experimental evidence which suggests that elements of the TPB are subject to reverse causality. Reciprocal relationships were found across three experimental studies. For instance, attitudes and subjective norms can be influenced by forming an intention to support an organisation. Based on these findings, we recommend that more experimental data is required to assess reverse causality in the sustainable food literature.

#### 4.1. Strengths and limitations

This scoping review provided a comprehensive exploration of the influence of culturally specific variables on sustainable food consumption through the lens of the TPB. Furthermore, rigorous discussions of the screening process resulted in high inter-rater agreement throughout the title, abstract and full text screening. Finally, the methodological quality of this scoping review was maintained by consistent reference to the PRISMA extension for scoping review checklist (Tricco et al., 2018). We also acknowledge the limitations of the current review. Most participants were from Western cultures. This could be reflected by the decision to exclude articles that were not published or translated in English. Therefore, other culturally specific variables may not be accounted for. Furthermore, a detailed account for the drivers of actual sustainable food consumption (as opposed to intentions) was not provided due to the lack of studies that measured behaviour in theoretical models. Finally, our understanding of culture was informed by the cultural dimension theory (Hofstede, 2010). Whilst we conceptualised cultural influences in this way (see introduction), it's important to note that there are important challenges to this theory. For instance, Non-Western cultures are becoming increasingly individualistic (Vignoles et al., 2016), and Western cultures have exhibited collectivist behaviours (Rhoads et al., 2021). Supporting this, our comparisons suggested that very few factors were specifically included by Western or Non-Western cultures. Instead, we found consistency in the application of the key TPB variables, but substantial variation in the application of culturally specific variables, both across and within cultures. This reinforces the importance of understanding cultural context, as the barriers and facilitators towards sustainable food consumption are likely to be nuanced.

#### 4.2. Conclusions

The findings of this scoping review suggests that the TPB is equally applicable to Western and Non-Western cultures. Generally, the key influencers of sustainable food consumption intentions were the TPB variables. Extended models predicted a higher variance in intentions. Although, the significance of this difference should be tested in a future systematic review or meta-analysis. When selecting culturally specific variables, Western cultures mainly included personal norms and self-identity. Non-Western cultures included environmental concerns and health consciousness. Apart from this, cross-cultural comparisons were limited due to the lack of cross-cultural studies, the variability of extended variables, and the lack of information on ethnicity. Furthermore, many studies did not fully measure the TPB, as key variables were often excluded, especially behaviour. Due to these knowledge gaps, the extent to which the original and extended TPB models can apply to sustainable food consumption across Western and Non-Western cultures is uncertain. However, addressing these gaps will facilitate the development of a culturally informed model that can be used as a framework

for interventions that promote sustainable food choices. Conducting cross cultural research where similar factors are examined across different consumer demographics will provide evidence for the establishment of universally applicable factors. Likewise, this approach enables the identification of significant culturally specific factors which can be tailored to interventions based on the target behaviour and the geographic location.

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## CRediT authorship contribution statement

**Tennessee Randall:** Conceptualization, Investigation, Visualization, Writing – original draft, Writing – review & editing. **Alecia L. Cousins:** Investigation, Writing – review & editing. **Louise Neilson:** Conceptualization, Writing – review & editing. **Menna Price:** Conceptualization, Writing – review & editing. **Charlotte A. Hardman:** Conceptualization, Writing – review & editing. **Laura L. Wilkinson:** Conceptualization, Resources, Supervision, Writing – review & editing.

## Declaration of competing interest

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

## Data availability

Data will be made available on request.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.foodqual.2023.105086>.

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