Religious values and social distance as activators of norms to reduce food waste when dining out

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HIGHLIGHTS

- Religious values affect personal norms of foodservice customers indirectly.
- The feeling of compassion and family upbringing mediate the effect of religious values.
- The feeling of respect for farmers' work exerts no influence on personal norms.
- Close encounters amplify the effect of injunctive norms on food waste reduction intention.
- Food waste reduction campaigns should appeal to compassion and family upbringing.

GRAPHICAL ABSTRACT
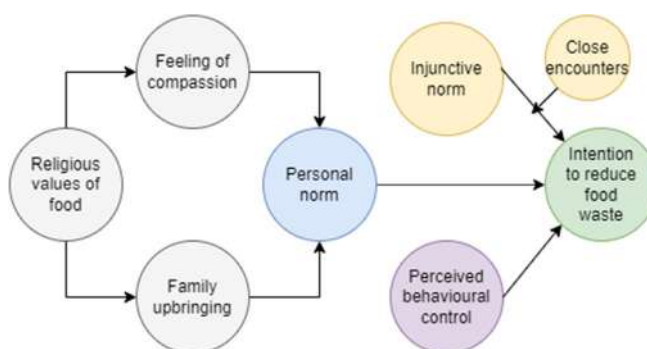
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ABSTRACT

Empirical research is required to identify psychological and psychographic factors which can activate or amplify norms of foodservice customers towards food waste reduction. By surveying 446 foodservice customers in Poland, a country with a large population of religion followers, this study examines the influence of religious values on personal norms and explores the moderating effect of social distance on injunctive norms. The results indicate that religious values do not activate personal norms directly but affect them indirectly via such mediating factors as the feeling of compassion and family upbringing. Close encounters, such as family and friends, amplify the effect of injunctive norms while distant encounters, such as fellow countrymen, do not. This suggests that measures for food waste reduction should be designed to appeal to the foodservice customers' feeling of compassion. The measures should also remind foodservice customers that their (grand)parents and friends would disprove food waste.

1. Introduction

The foodservice sector contributes 26 % to the global societal challenge of food waste (FW) (UNEP, 2021). Urgent interventions are necessitated to reduce this contribution and enable the sector's progress towards its sustainability goals (Dhir et al., 2020). The interventions should be concerned with the supply and demand side of foodservice provision as equally signif-icant FW occurs in the kitchen and on customer plates (Filimonau and de Coteau, 2019).

Different psychographic/psychological factors can explain why FW is generated by foodservice customers. Septianto et al. (2020) have shown how emotions affect public perceptions of FW and drive consequent consumer behaviour. Filimonau et al. (2020) have outlined environmental concern as a determinant of foodservice customers' intention to prevent food from being discarded. Sirieix et al. (2017) have demonstrated how personal norms of foodservice customers influence their intention to (not) save food from going to waste. Stöckli et al. (2018a) have pinpointed social norms as

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the important antecedents of wasteless consumer behaviour. Chen and DeSalvo (2022) have indicated the role of altruistic values of foodservice customers in reducing FW. Coskun and Ozbuk (2020) have revealed the effect of personal pro-environmental attitudes of foodservice customers on their intention to save food from being wasted. Lastly, Yu et al. (2021) have suggested that habits represent the key antecedents of FW behaviour when dining out.

A systematic review of pro-environmental behaviour studies in hospitality and tourism by Lin et al. (2022b) showcases that norms, environmental concern and environmental attitudes have been examined most often to-date. However, other psychographic/psychological factors can also affect FW generation by foodservice customers (Talwar et al., 2021). These factors can influence consumer behaviour directly, but they can also activate norms and attitudes (Filimonau et al., 2022c). Better understanding of these factors can inform design of policy and management interventions to facilitate behavioural changes to reduce FW in foodservice provision (Stöckli et al., 2018b).

Religious values may represent a psychographic/psychological factor which deserves in-depth investigation. It has been established that religious values may affect FW behaviour; however, there is a limited understanding of religion and religiosity as the direct influencers of pro-environmental behaviour or as activators of other psychographic/psychological factors (Lin et al., 2022b). The meta-analysis of pro-environmental behavioural intentions of hospitality consumers (Lin et al., 2022a) identifies only two studies dealing with religious values and FW. Elshaer et al. (2021) have surveyed religiosity and FW among restaurant guests in Saudi Arabia. Despite using foodservice customers as datapoints, this study has established the positive effect of religion on FW reduction intention in general, rather than when dining out. Filimonau et al. (2022b) have interviewed restaurant guests to explore the interplay between religiosity and FW behaviour in Iraq. This study, despite its foodservice focus, is however qualitative which, while offering useful initial insights, prevents generalisation.

Studies have examined the relationship between religiosity and FW behaviour in households (Elhoushy and Jang, 2021; Minton et al., 2020; Qian et al., 2022). Although these studies provide a valuable perspective, their results cannot be translated into the foodservice sector. Foodservice provision is unique in that many factors affect its customers' behaviour (Juvan and Dolnicar, 2017). Food consumption at home is routinised, can be better planned, and is less influenced by emotions, social status, and etiquette (Schanes et al., 2018). In contrast, food consumption away from the home is considered 'special', affected by sentiments, and influenced by other people, especially during social events (Filimonau et al., 2018). For instance, the cultural trait of 'face' in China referring to the idea of hospitability encourages over-ordering with resultant FW (Gao et al., 2021). Infrequent nature of dining out prompts even environmentally conscious customers to temporarily forget environmental responsibilities, thus driving FW (Coskun and Filimonau, 2021). The results of household studies on religiosity and FW should not therefore be directly projected onto foodservice provision.

Another psychographic/psychological factor in FW generation by foodservice customers which remains insufficiently understood is social norms. Social norms are the key antecedents of pro-environmental behaviour in hospitality (Lin et al., 2022b) because they set behavioural standards accepted and shared by specific groups of people. Consumers tend to behave in a manner which their reference group is likely to approve (Hamerman et al., 2018). For instance, it is thought that people will reduce FW if they think their reference group will endorse FW reduction (Kim et al., 2020).

However, research on social norms as the antecedents of FW reduction has not considered the effect of social/psychological distance. Social/psychological distance explains the extent of 'proximity' within which different reference groups are viewed by people (Woosnam and Lee, 2011). Immediate family members and friends are viewed socially/psychologically 'closer' than members of an extended family, acquaintances, and neighbours (Krackhardt and Kilduff, 1999). The standards of behaviour approved by closer reference groups may therefore be more influential compared to

'distant' reference groups (Schreiner et al., 2018). Social/psychological distance can moderate the power of social norms, but this moderation effect has not been investigated empirically in the context of FW in foodservice provision.

This study examines the role of religious values as the antecedents of personal norms in intention of foodservice customers to reduce FW. The study thus addresses the knowledge gap attributed to the limited scholarly understanding of the role played by religious values in FW reduction when dining out. Religious values can affect personal norms directly, but also indirectly via such factors as family upbringing, the feelings of respect and compassion. This current study investigates how/if these factors mediate the relationship between religious values and personal norms. Another knowledge gap which this study has set to address is the perceived proximity effect i.e., 'close' versus 'distant' encounters, exerted by different reference groups of foodservice customers on their social norms towards FW reduction. The power of all these variables is examined through theory of planned behaviour (TPB) (Ajzen and Fishbein, 1980) which represents the most popular analytical framework for studying pro-environmental behavioural intentions of hospitality consumers (Lin et al., 2022b). To achieve the goal of this study, TPB is augmented with the new variables of interest as explained in the next section.

2. Conceptualisation and development of research hypotheses

2.1. Theory of planned behaviour (TPB)

TPB is widely used in the domain of environmental psychology of consumption (Klöckner, 2013). It is often applied to study pro-environmental behavioural intentions of foodservice customers (Liu et al., 2022; Moon, 2021; Wang, 2016) including their intention to reduce FW (Coskun and Ozbuk, 2020). TPB integrates three elements: attitudes, social norms (referred to as subjective norms in TPB) and perceived behavioural control (PBC) that are thought to affect pro-environmental consumer intentions (Klöckner, 2013).

In TPB the element of 'attitude' explains if a consumer has a (un) favourable appraisal of their behaviour (Ajzen and Fishbein, 1980). The element 'subjective norms' captures the influence of external, social factors on consumer behaviour (Ajzen, 1991). The 'PBC' element explains how consumers perceive the (un)ease of exerting a specific behaviour pattern, such as FW prevention (Ajzen and Fishbein, 1980). TPB has demonstrated its high predictive power in previous FW management studies (see, for example, Coskun and Ozbuk, 2020; Mak et al., 2018; Mak et al., 2019). The results of TPB research have also informed the design of FW policies (Mak et al., 2020), including those in the sector of foodservice provision (Soorani and Ahmadvand, 2019). TPB has therefore proven its significant adaptability potential for future studies on FW and consumer behaviour.

The main reason for TPB's popularity in research on pro-environmental behaviour of foodservice customers is its well-established nature as TPB has proven viable when applied in various markets of out-of-home food consumption (Lin et al., 2022b). Another benefit of TPB is flexible design which enables integration of new variables in analysis (Ulker-Demirel and Ciftci, 2020). This supports the development of augmented research models which can, at least partially, compensate the shortcomings of TPB (Kim et al., 2013).

One of the shortcomings of TPB is weak correlation established empirically between attitudes and pro-environmental behavioural intentions. Armitage and Conner (2001) have long argued that attitudes should be considered an insufficient determinant of behavioural intentions, especially in non-static, dynamic consumption contexts where many other factors may affect consumers. Food consumption outside the home represents such dynamic context. Research has confirmed empirically that the positive effect of attitudes on intentions of foodservice customers to reduce FW can be significantly diminished (Elshaer et al., 2021) or even eliminated (Coskun and Filimonau, 2021).

In contrast, numerous studies have demonstrated that PBC represents the strongest determinant of consumer intention to reduce FW in

foodservice provision (Coskun and Ozbuk, 2020; Liu et al., 2022; Watanabe et al., 2022). This can be explained by responsibility which foodservice customers assume for FW when dining out (Sirieix et al., 2017). Although foodservice providers can undermine this responsibility by, for instance, excessive portioning (Filimonau and Sulyok, 2021), in most cases, consumers can sufficiently control their actions. For example, even if a portion is large, a take-away box can be requested for plate leftovers.

Given that research has established weak correlation between attitudes and intentions of foodservice customers to reduce FW, and because studies have conversely shown the strongest effect of PBC on FW reduction intention, this study excludes attitudes from analysis and hypothesises that *H1: PBC positively affects intention of foodservice customers to reduce FW*, Fig. 1.

2.2. Personal norms

Another shortcoming of TPB is its inability to explain how the antecedents of pro-environmental behaviour are formed (Manstead, 2011). TPB assumes that consumers possess attitudes (for example, to reduce FW), but it does not clarify the underlying factors which must have shaped these attitudes (Sniehotta et al., 2014). Research shows that attitudes are insufficient predictors of consumer intention to reduce FW. This calls for a better understanding of other factors, extending beyond, relating to, or underlying attitudes, which can prompt consumers towards FW reduction. When integrated into TPB, these factors will improve its explanatory power (Botetzagias et al., 2015).

Personal norms represent one of the factors worth integrating in TPB. Personal norms, defined as people's expectations of themselves (Schwartz and Tessler, 1972), have long been shown to relate to attitudes (Conner and Armitage, 1998). However, compared to attitudes, personal norms are believed to better explain behavioural intentions (Klöckner, 2013). Research on FW in foodservice provision has showcased personal norms as strong, direct predictors of customer intention to reduce FW (Sirieix et al., 2017). Likewise, when considered one of the three variables forming pro-environmental attitudes of restaurant guests (i.e., attitude, personal norm, and social norm), personal norm has been found to exert the strongest effect on FW reduction behaviour (Kim et al., 2020). This effect can be determined by the cultural background of foodservice customers as well as by the markets of food consumption outside the home. For example, Kim

et al. (2020) have shown the significant effect of personal norm on consumer intention to reduce FW in South Korea, a country with well-established policies and strong cultural values on FW reduction. In contrast, Filimonau et al. (2023) have demonstrated the insignificant effect of personal norm on intention of foodservice customers to reduce FW in Iraq, a country where consumer awareness of FW is low while governmental policies on FW remain immature.

Therefore, this study integrates personal norms in the analysis and hypothesises that *H2: Personal norms positively affect intention of foodservice customers to reduce FW*, Fig. 1.

The critique of personal norms as a stand-alone variable in studies of pro-environmental consumer behaviour resembles the critique of attitudes in the context of TPB; namely, personal norms do not occur on their own (Gifford and Nilsson, 2014) and other, underlying factors should be identified which can activate personal norms towards FW reduction (Visschers et al., 2016). These factors can be attributed to individual traits of consumers, such as self-construal, personal interests/values, and emotions (Saracevic and Schlegelmilch, 2021). Social traits, such as childhood experience, education, and religion/culture, should also be considered prospective norm activators (Sorokowska et al., 2020). Importantly, social traits can affect individual traits: for instance, education and religion can shape personal interests/values of consumers (Long et al., 2022).

2.3. Religious values of food

Religion represents an interesting variable to study as a potential activator of personal norms of foodservice customers. Food consumption is an important religious marker (Tuhin et al., 2022). For instance, Islam requires halal compliance, Hinduism promotes specific, restrictive diets, and Buddhism prohibits consumption of animals (Li et al., 2020). Religion explicitly discourages FW by considering it 'haram', or forbidden, in Islam or referring to it as a 'sin' in Christianity (Özbük et al., 2022). This suggests that religious values of food can influence personal norms of foodservice customers, especially if they practice a religion (Mumuni et al., 2018). Therefore, this study hypothesises that *H3: Religious values of food positively affect personal norms of foodservice customers*, Fig. 1.

The influence can be particularly high if religious values of food have been cultivated in childhood i.e., when personal outlook and identity are
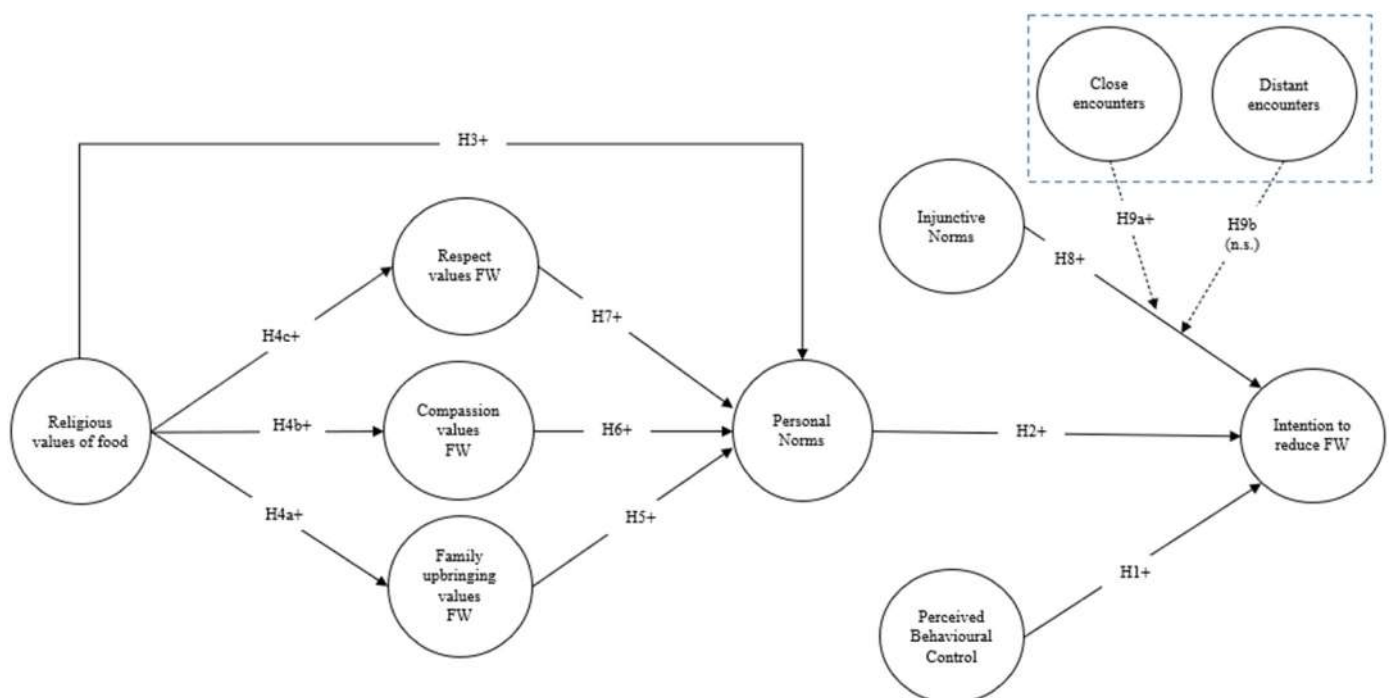

Fig. 1. The research model.

formed. This is supported empirically: for example, Wardhani et al. (2018) demonstrate how an understanding of halal food among young children is fostered by parents. Muhialdin et al. (2022) showcase the role of (grand) parents in cross-generational transfer of knowledge on food preparation methods and techniques, including halal compliance.

2.4. Family upbringing

Children are unlikely to uptake religious values of food on their own. Children are exposed to these values by specific agents, such as (grand)parents at home or (school) teachers outside the home (Eagles and Demare, 1999). Informal education, sometimes referred to as family upbringing, is defined as the education provided by adult family members at home (Krischer et al., 2020). Together with formal education provided by institutional agents, such as schools, informal education forms children's identity and shapes their personal norms as future consumers (Murray, 2021). For instance, Sorokowska et al. (2020) showcase that, at age five, children become conscious of FW which pinpoints the importance of parents in reinforcing this consciousness by educating children on the detriment of wastage. Filimonau et al. (2022c) demonstrate how parents can cultivate religious values of food among children, thus encouraging FW reduction when children grow up.

Albeit providing interesting, initial insights regarding the role of religious values and family upbringing as potential activators of personal norms of future consumers, the study by Filimonau et al. (2022c) has two shortcomings. First, the findings have not been contextualised as religious values are assumed to exert the same effect when consuming food at home and away. The context of food consumption away from the home differs significantly from food consumption in households which warrants a separate investigation. Second, due to the exploratory nature of their study, Filimonau et al. (2022c) have measured religious values and family upbringing with single survey items. Single-item measures have limited reliability and require validation. The effect of religious values of food and family upbringing on FW reduction behaviour should be established with more robust measures. Therefore, this study hypothesises that *H4a: Religious values of food positively affect family upbringing of foodservice customers* and *H5: Family upbringing positively affects personal norms of foodservice customers*, Fig. 1. Family upbringing is thus considered a mediator.

2.5. Compassion

Religious values of food can affect personal norms of foodservice customers directly and indirectly i.e., by triggering other norms, like in the case of family upbringing. A norm which can be triggered by religious values of food is the feeling of compassion understood as sympathy towards and concern for the sufferings or misfortunes of other people (Surman et al., 2021). Compassion is directly related to religiosity as it represents one of the key religious traits with empirical evidence showcasing correlation between individuals' religious commitment and compassion for the others (Saslow et al., 2013). Compassion is also related to the issue of FW because significant quantities of food are wasted in presence of hunger and poverty (Galli et al., 2019). Globally, at least 0.7 billion people face hunger and over 3 billion people do not have access to a healthy, nutritious diet (FAO, 2019). Concurrently, saving the world's FW can feed at least 1.26 billion people per year (FAO, 2019), thus significantly reducing the major societal challenge of hunger and under-nutrition.

Compassion has recently been integrated into FW research albeit not specifically in studies on FW reduction in foodservice provision. Surman et al. (2021) have established the importance of compassion for food bank volunteers showcasing how it determines their willingness to help others. Graham-Rowe et al. (2019) demonstrate how compassion predicts pro-environmental behaviour in the context of household FW whereby it represents one of the values prompting people to save food from going to waste. No empirical studies have considered compassion as an antecedent

of FW reduction when dining out although Mirosa et al. (2016, p. 2337) in their exploratory, qualitative investigation of restaurant plate waste have acknowledged that *'foodservice customers may develop compassion towards the [FW] issue and stimulate the desire to help to protect the welfare of others…'*. Therefore, this study hypothesises that *H4b: Religious values of food positively affect compassion of foodservice customers* and *H6: Compassion positively affects personal norms of foodservice customers*, Fig. 1. Compassion is thus considered a mediator.

2.6. Respect

Religious values of food can also trigger another norm related to religiosity and FW i.e., the feeling of respect. From the religious viewpoint, respect is often considered in the context of tolerance (towards others), but also appreciation of others' work. For instance, The Bible states *'The harvest is plentiful, but the laborers are few. Therefore, pray earnestly to the Lord of the harvest to send out laborers into his harvest'* (Luke 10:1–12). This statement urges people to respect the work of growers and farmers as this work is essential for feeding populations (Food for the Hungry, 2022).

The concept of respect for farmers' work is relevant for the FW issue. At least 17 % of world's food produced for human consumption is lost or wasted by consumers (UNEP, 2021) which suggests that a significant share of farmers' effort and resources is wasted too. This wastage becomes critical considering that popularity of farming as a career path is decreasing (Booth, 2021). Moreover, COVID-19 has revealed vulnerability of the global food systems driving a food crisis (Clapp and Moseley, 2020). This crisis has subsequently been fuelled by the war in Ukraine leading to increased prices and reduced availability of food (Ben Hassen and El Bilali, 2022). Paying respect to farmers' work by saving food from going to waste is therefore essential for progressing towards global sustainability goals and encouraging people to consider farming as a life-long career opportunity.

Importantly, in countries with strong agricultural heritage and evidence of past food scarcity, consumers are often reminded about the hard work of farmers to prompt respect for this work. For example, the 'Cult of Bread' existed in many former communist states of East-Central Europe and Russia due to post-war food scarcity (Newizv, 2020). This cult encouraged citizens to recognise that bread was the product of a peasant's hard work on the land and a symbol of national food security (Krajewski, 2021). Disposal of bread was discouraged; any leftovers or mouldy and stole bread would be provided as feedstock to either domestic animals or wild birds. The cult of bread is still followed in many post-communist societies by older generations (Chalyan, 2019). For instance, in modern Poland, bread represents the most important existential value, abundance and fertility (Krajewski, 2021). Further, Polish proverbs showcase how bread has maintained its important societal value for centuries; for example, "bread earned by work is tasty and filling"; "[(s)he] who has bread has everything"; "the most important thing is bread, the rest is an addition to bread" (Kubiak and Kubiak, 1981). In particular, the Polish Catholics explicitly refer to bread in their prayers, such as "Give us today our daily bread" (St. Matthew 6:11).

Respect has recently been featured in FW research albeit not specifically in foodservice provision. Schmidt (2022) discusses the role of communal respect to farmers' work and highlights the sacred value attributed to farm produce in indigenous Mayan communities. Muhialdin et al. (2021) demonstrate how respect to traditional methods of food growing and farming determines reduced FW in Iraqi households. Filimonau et al. (2022a) showcase how COVID-19 has prompted UK residents to respect the work of local farmers and affected FW generation at home. The role of respect as a potential antecedent of FW reduction in the context of food consumption away from the home deserves more attention. Therefore, this study makes two hypotheses: *H4c: Religious values of food positively affect respect of foodservice consumers towards farmers* and *H7: Respect towards famers positively affects personal norms of foodservice customers*. Respect is thus considered a mediator, Fig. 1.

2.7. Social norms

TPB integrates social (or subjective, as per TPB terminology) norms assuming that, as social beings, consumers are influenced by normative pressure from the society where they live (Klöckner, 2013). Social norms can be divided into descriptive and injunctive (Manning, 2009). Descriptive norms relate to social pressures based on the observed behaviour of others; for instance, *'Most people who are important to me reduce FW'* (Elhoushy and Jang, 2021). Injunctive norms describe social pressures to engage in a behaviour anticipating that others will approve this behaviour; for example, *'If I generate FW, my family/friends will disapprove'* (Coskun and Ozbuk, 2020).

Social norms in TPB were originally conceptualised as injunctive (Manning, 2009). There are calls to integrate both types of social norms in FW research in foodservice provision (Goh et al., 2022); however, injunctive norms remain to be the most popular analytical construct within TPB (Stancu et al., 2016). One reason is the difficulty in anticipating behaviour of other people when dining out because this context of food consumption is too dynamic. For instance, it can be difficult for foodservice customers to judge if 'people who are important to them' reduce FW in restaurants. Another reason is weak correlation between social norms and behavioural intention to reduce FW demonstrated by empirical research (Elhoushy and Jang, 2021). Integration of both types of social norms in analysis can complicate a research instrument while adding limited value to analysis. Therefore, this study employs injunctive norms and hypothesises that *H8: Injunctive norms positively affect intention of foodservice customers to reduce FW*, Fig. 1.

2.8. Social/psychological distance

Social/psychological distance is defined as the degree of perceived closeness or remoteness towards other members of various social groups (Tasci, 2009). For example, representatives of the same gender/race or nationals of the same country may feel closer to each other (Park, 1924). To measure social distance, the Social Distance Scale was developed looking at the level of people's acceptance of members of certain 'other' groups (Bogardus, 1933).

In tourism and hospitality social/psychological distance has been studied from the perspective of socio-cultural prejudices between customers and residents, but also from the viewpoint of perceived attractiveness of tourism/hospitality products and destinations (Aleshinloye et al., 2020). Studies have shown that domestic tourism has low social/psychological distance resulting in higher solidarity between domestic visitors and residents (Joo et al., 2018). The effect of social/psychological distance has also been detected among tourist groups represented by close friends as opposed to strangers (Wang et al., 2022).

In foodservice provision the effect of social/psychological distance has been examined, albeit indirectly, from the viewpoint of food origin. Prior to COVID-19, foodservice customers preferred local food to imported food due to its benefits for economy and the environment (Feldmann and Hamm, 2015). The pandemic has increased this 'local' appeal showcasing increased consumer support for local farmers and growers and, therefore, decreasing social/psychological distance (Filimonau et al., 2022a).

This study hypothesises that *H9a: Close encounters amplify the influence of injunctive norms on intention of foodservice customers to reduce FW*, and *H9b: Distant encounters do not amplify the influence of injunctive norms on intention of foodservice customers to reduce FW*, Fig. 1. Social/psychological distance is thus considered a moderator whose effect depends on the proximity of social/psychological encounters. Parents, family members and friends (including friends on social media) are viewed as the close encounters while fellow countrymen, residents of Europe and world citizens are considered the distant encounters.

3. Materials and methods

3.1. Questionnaire design

Data were collected in Poland by the paper-and-pencil interviewing (PAPI) survey technique. Poland was chosen for data collection because

its population is very religious i.e., 90 % of Poles categorise themselves as 'believers' (Statistics Poland, 2020). Further, Poland has long-established traditions of strong family ties whereby parents exert significant influence on children (Falkowski et al., 2017). Lastly, Poland is one of the post-communist states whose residents were encouraged to respect food.

The survey questionnaire contained seven sections. Section 1 established the experience of dining out by measuring the frequency of food consumption outside the home and recording the most frequently visited categories of foodservice providers. Section 2 captured customer perceptions of such values of food as religious, family upbringing, compassion, and respect, all measured with three items each. This study was exploratory which implied that no established survey measures to capture some constructs were available in the literature. The measures in this section were therefore developed from the new using literature to facilitate design of survey measures. The measures for compassion were developed from Davis (1980). The measures for religious values of food and family upbringing were developed from Filimonau et al. (2022c). The measures for respect were developed from Muhialdin et al. (2021) and Schmidt (2022). Section 3 captured customer norms towards FW. Personal and injunctive norms were measured with three items each adopted from Elhoushy and Jang (2021). Section 4 measured the proximity effect of social distance on injunctive norms. The measures in this section were developed from the new grounding on the Social Distance Scale of Bogardus (1933). Close proximity was measured with four items including one item capturing the effect of social media friends and followers. This item was added because of the increasing importance of social media for FW reduction behaviour as demonstrated by Young et al. (2017). Distant proximity was measured with three items. Sections 5 and 6 captured PBC and intention to reduce FW when dining out, respectively. These constructs were each measured with three original items from Coskun and Ozbuk (2020). Section 7 collected socio-demographic data.

Research has established the tendency of Poles to avoid providing explicit answers in consumer surveys by choosing the 'neutral/undecided' option. (Dickinson et al., 2013; Filimonau et al., 2018). Therefore, the 4-point Likert-type scale was used to operationalise items in all sections of the questionnaire except for Sections 1 and 7. Although the 5-point Likert-type scale is used more frequently in consumer surveys, Chyung et al. (2017) highlight such benefit of the 4-point scale as reduced social desirability bias. Chyung et al. (2017) argue that the 4-point scale can be more appropriate to survey respondents who are known to prefer the 'neutral/ undecided' option, such as in the case of Poland.

3.2. Survey preparation and administration

The questionnaire was designed in English and back translated to Polish. As some measures were developed from the new, content and face validity of the questionnaire were tested. The questionnaire was reviewed by three academics majoring in food studies, hospitality management, and family psychology. These academics were explained the study's purpose; they were subsequently requested to confirm if the survey measures proposed were meaningful, especially the measures developed from the new. The feedback was used to rephrase some questions for clarity.

The revised questionnaire was subsequently piloted with a group of 21 volunteers representing various socio-demographic profiles of Polish foodservice customers as defined by RG (2021). The pilot's feedback facilitated further, minor changes to how some questions were phrased, thus developing a coherent questionnaire, free from ambiguous wording. A copy of the final version of the questionnaire is provided in Supplementary material, Appendix A.

The survey was administered in October–December 2021 in Krakow, the 2nd largest city of Poland. The survey dates were dictated by the national COVID-19 restrictions and the fieldwork only took place when the restrictions were lifted. Prospective respondents were approached by the research team in the Old Town of Krakow with its large cluster of foodservice operators. To ensure eligibility, all prospective respondents were first required to confirm if they consumed food outside the home at

least once in the last year. Those responding negatively to this filtering question were not invited to the main survey.

Recruitment of willing respondents considered the balance between the key socio-demographic groups of Polish foodservice customers as described in RG (2021). To this end, recruitment began with convenience sampling but, following completion of 300 questionnaires, quota sampling was applied. For the quota sampling recruitment targeted those socio-demographic groups of Polish foodservice customers who were under-represented in the sample collected by the convenience method. For example, RG (2021) suggest that more than half of Poles dine out only occasionally. Therefore, the quota sampling approach involved recruiting respondents who dined out either 'rarely' or 'sometimes'. The final, usable sample consisted of 446 questionnaires, Table 1. The response rate in the convenience sampling part of the survey was circa 92 %, thus indicating significant interest of Polish foodservice customers in the topic examined.

4. Analysis and results

Partial Least Squares Structural Equation Modelling (PLS-SEM) with the software SMART-PLS 3.0 was used to test the research hypotheses. The choice of PLS-SEM was determined by the following considerations. First, some of the analysed constructs can be conceptualised as composites which PLS-SEM is capable of handling effectively (Hair et al., 2019). For example, values of food and the proximity encounters can be interpreted as the theoretical thought artefacts composed of different elemental aspects to be modelled as composites. Second, the research model combines the well-established measures (for example, PBC and FW reduction intention) with the measures that are either novel or have only recently been designed (for instance, religious values of food and the feeling of respect). PLS-SEM is best positioned for application in such exploratory investigations (Hair et al., 2021). Third, the research model is rather predictive than confirmatory given that the current study, through augmented TPB theory, tests how/if different factors can explain FW reduction intention of foodservice customers in situations where right or wrong actions are important (Rigdon, 2016). Lastly, PLS-SEM is most appropriate for a complex, exploratory analysis involving numerous constructs with limited conceptualisation (Cepeda-Carrion et al., 2019).

4.1. Analysis of the measurement model

PLS-SEM requires assessing the measurement model to guarantee reliability and validity of the research instrument. All composites were modelled as mode-A (composite reflective constructs) because high correlation between the manifest indicators was a priori expected and due to the items representing more consequences rather than causes of the constructs (Hair et al., 2019). Individual and composite reliability of the indicators and constructs were evaluated alongside their convergent and discriminant

validity. During the evaluation, although the item CLO4 ($\lambda = 0.660$) presented an outer loading below 0.7 it was retained because of its closeness to the threshold to preserve content validity.

Tables 2 and 3 present the results of the structural model assessment. Most of the outer loadings are above the critical threshold of 0.708 and do not exceed the value of 0.950 that could indicate redundancy (Hair et al., 2021). Construct reliability and the Dijkstra and Henseler's rho are within the recommended interval (0.800; 0.900) and the Average Variance Extracted (AVE) is above 50 % (Hair et al., 2019). Therefore, the measurement model presents individual and composite reliability while convergent validity is also guaranteed.

To evaluate discriminant validity of the model, the heterotrait-monotrait ratio (HTMT) approach was followed (Henseler et al., 2015). The HTMT method assesses HTMT of the constructs' correlations, by comparing correlations of the indicators across the constructs measuring different variables (heterotraits) with correlations of the indicators within the same construct (monotraits). The HTMT ratios below 0.90 and, more strictly, below 0.85 indicate that constructs are statistically and sufficiently different to each other. As Table 3 shows, discriminant validity is met since all HTMT ratios are below 0.85 with the highest value of 0.751.

4.2. Analysis of the structural model

The structural model was evaluated by exploring the potential problem of collinearity and by assessing its predictive capacity and relevance (Hair et al., 2019). Collinearity was examined through the Variance Inflation Factors (VIFs) of all exogenous variables. All VIFs were below the strictest threshold of 3.3 with the highest value of 1.672 for the 'respect' construct. The predictive power of the model was confirmed as the determination coefficient (R^2) for the final dependent variable 'intention to reduce FW' was 49.7 %. As for the remaining endogenous variables, the model was able to explain 24.1 % of variance for 'personal norms, 17.0% for 'respect',12.1% variance for 'compassion', and 9.6 % for 'family upbringing'.

To assess predictive relevance of the model, the procedure suggested by Shmueli et al. (2016) and described in Hair et al. (2021) was followed and a PLSPredict analysis was implemented. The results revealed that Q^2 metrics were positive for all indicators of the predicted latent variable 'intention to reduce FW' (Table 4). Comparison between the prediction error of the proposed model with an alternative naïve linear benchmark model revealed that, from the six possible comparisons, the predictor error was larger for the alternative model than for the model proposed in five comparisons. Hence, the model presented a medium-high prediction relevance for the variable 'intention to reduce FW'.

To assess the sign, magnitude and statistical significance of the model's structural parameters, a bootstrapping procedure with 8.000 subsamples and one tail test was employed (Streukens and Leroi-Werelds, 2016). To explore the effect of control variables, the same test, with two-tails, was

Table 1

Description of the sample (n = 446).

Gender		Personal salary	
Male	42.8 %	Lower than the average of the country	31.4 %
Female	57.2 %	Higher than the average of the country	36.5 %
		Prefer not to say	32.1 %
Level of education		Occupation	
Higher education	40.1 %	Full-time	65.5 %
College/high school	33.2 %	Part-time	5.2 %
Professional degree	22.2 %	Retired	13.7 %
Primary/Secondary school	3.4 %	Student	5.7 %
Other	1.1 %		
Age		Children	
16–24	18.2 %	Yes	58.7 %
25–34	19.3 %	No	41.3 %
35–44	17.3 %	Frequency of dining out	
45–54	22.0 %	Rarely	37.5 %
55–64	12.8 %	Sometimes	27.6 %
65–74	6.1 %	Often	25.2 %
>75	4.5 %	Very often	9.7 %

Table 2
Measurement model.

Latent variable	Indicator	Standardized loading	Henseler's rho	Composite Reliability Index (CRI)	Average Variance Extracted (AVE)
Religious Values (RV)	RV1	0.949	0.943	0.963	0.895
	RV2	0.940			
	RV3	0.948			
Compassion (COM)	COM1	0.893	0.852	0.908	0.767
	COM2	0.897			
	COM3	0.837			
Respect (RES)	RES1	0.928	0.910	0.943	0.847
	RES2	0.930			
	RES3	0.903			
Family upbringing (FAM)	FAM1	0.785	0.753	0.853	0.659
	FAM2	0.809			
	FAM3	0.841			
Personal Norms (PN)	PN1	0.879	0.827	0.893	0.735
	PN2	0.902			
	PN3	0.787			
Injunctive Norms (IN)	IN1	0.903	0.888	0.928	0.812
	IN2	0.936			
	IN3	0.863			
Perceived Behavioural Control (PBC)	PBC1	0.897	0.831	0.891	0.742
	PBC2	0.852			
	PBC3	0.817			
Proximity-Distant (DIS)	DIS1	0.904	0.906	0.930	0.733
	DIS2	0.911			
	DIS3	0.897			
Proximity-Closeness (CLO)	CLO1	0.914	0.905	0.910	0.720
	CLO2	0.908			
	CLO3	0.885			
	CLO4	0.660			
Intention to reduce food waste (INT)	INT1	0.918	0.898	0.935	0.827
	INT2	0.913			
	INT3	0.897			

Table 3
Discriminant validity of the model.

Construct	RV	COM	RES	FAM	PN	IN	PBC	DIS	CLO
RV									
COM	0.389								
RES	0.445	0.615							
FAM	0.360	0.460	0.546						
PN	0.289	0.526	0.373	0.456					
IN	0.314	0.528	0.550	0.627	0.614				
PBC	0.091	0.161	0.171	0.404	0.306	0.470			
DIS	0.386	0.305	0.271	0.274	0.352	0.350	0.291		
CLO	0.360	0.285	0.231	0.355	0.561	0.417	0.336	0.629	
INT	0.214	0.258	0.273	0.455	0.481	0.491	0.751	0.294	0.402

Note 1: Figures represent the HTMT ratios among the latent variables.
Note 2: See Table 2.

processed. A two-stage approach was used to calculate the moderating effects of self-image congruity (SIC) (Henseler and Chin, 2010).

4.3. Common method variance assessment

To control for potential common method bias, survey respondents were reassured in anonymity and confidentiality of their responses. The process of filling the questionnaire was observed by the research team who remained on call in case of any questions and ensured there were no speeders.

Table 4
Predictive relevance of the model.

Manifest variable	Q^2	RMSE proposed model	RMSE linear model	MAE proposed model	MAE linear model
INT1	0.360	0.556	0.554	0.411	0.414
INT2	0.340	0.513	0.525	0.365	0.372
INT3	0.423	0.539	0.542	0.375	0.385

Note: RMSE = Root Mean Squared Error of Predictions; MAE = Mean Absolute Error.

Further, the questionnaire was designed in a way that questions were presented in an order where respondents could not infer the causation between variables.

Correlations between latent constructs were analysed to further assess for common method variance. The analysis revealed no evidence of high values that could indicate common method bias (Benitez et al. 2020). The highest correlation was 0.649 i.e., substantially lower than the threshold of 0.9 (Bagozzi et al., 1991). In addition, a full collinearity test evidenced that the variance inflations factors ranged from 1.118 to 2.019 which were considerably lower than the typical threshold of 5 or 3.3 (Kock and Lynn, 2012). Finally, an exploratory factor analysis of the indicators with varimax rotation revealed the existence of 8 potential factors. All these factors altogether explained 70.7 % of variance with the highest contributing factor being 31.7 %. All these analyses indicated that common method variance was not present in the research model.

4.4. Analysis of results

Table 5 and Fig. 2 present the structural model's results. As initially expected, PBC ($\beta = 0.532$; $t = 12.695$) and personal norms ($\beta = 0.186$; $t = 3.745$) exert a large effect on intention of foodservice customers to reduce FW, thus confirming Hypotheses 1 and 2. Contrary to initial expectations, religious values of food neither directly nor significantly affect personal norms ($\beta = 0.063$; $t = 1.292$), thus rejecting Hypothesis 3. However, religious values of food explain such values as respect ($\beta = 0.415$; $t = 8.956$), compassion ($\beta = 0.351$; $t = 7.289$) and family upbringing ($\beta = 0.309$; $t = 6.739$), thus confirming Hypotheses 4a, 4b and 4c. Additionally, compassion ($\beta = 0.340$; $t = 5.667$) and family upbringing ($\beta = 0.206$; $t = 3.652$) positively affect personal norms, thus confirming Hypotheses 5 and 6. The value of respect does not however influence personal values ($\beta = 0.018$; $t = 0.256$), thus rejecting Hypothesis 7.

To further explore the possible indirect influence of religious values of food on personal norms, the Zhao et al.'s (2010) approach was implemented. To this end, a bootstrapping of 8.000 subsamples was applied to determine significance of possible indirect effects. The results indicated

Table 5
Results of the structural model.

Hypothesis	β	t-Value
H1: Perceived Behavioural Control → Intention to reduce food waste	0.532	12.695*
H2: Personal Norms → Intention to reduce food waste	0.186	3.745*
H3: Religious values → Personal Norms	0.063	1.292
H4a: Religious values → Family upbringing	0.309	6.739*
H4b: Religious values → Compassion	0.351	7.289*
H4c: Religious values → Respect	0.412	8.956*
H5: Family upbringing → Personal Norms	0.206	3.652*
H6: Compassion → Personal Norms	0.340	5.667*
H7: Respect → Personal Norms	0.018	0.256
H8: Injunctive Norms → Intention to reduce food waste	0.114	2.193**
H9a: Injunctive Norms x Close → Intention to reduce food waste	0.089	1.804**
H9b: Injunctive Norms x Distant → Intention to reduce food waste	−0.010	0.209
R^2(INT) = 0.497; R^2(COM) = 0.121; R^2(RES) = 0.170; R^2(FAM) = 0.096; R^2(PN) = 0.241		

Note 1: See Table 2.
Note 2: *p < 0.01; **p < 0.05 based on a one-tailed test.

that, although religious values of food did not directly affect personal values which was aligned with the rejection of Hypothesis 3, the indirect influence was significant through compassion (β = 0.119; t = 5.055) and family upbringing (β = 0.064; t = 3.382). The indirect path via the variable 'respect' was not however significant (β = 0.007; t = 0.257) because the direct influence of 'respect' on personal norms was also insignificant, as established earlier.

Injunctive norms affect positively and significantly intention of foodservice customers to reduce FW (β = 0.114; t = 2.193), thus confirming Hypothesis 8. As for the moderation effect of proximity encounters, the amplifying influence of injunctive norms on intention to reduce FW is not moderated by distant encounters (β = −0.010; t = 0.209), thus confirming Hypothesis 9b. The amplifying effect is however positively and significantly moderated by closer encounters (β = 0.089; t = 1.804), thus confirming Hypothesis 9a.

As for the control variables, two are statistically significant. First, the frequency of dining out negatively and significantly affects intention of foodservice customers to reduce FW (β = −0.089; t = 2.196). Second, salary exerts another negative effect on intention to reduce FW (β = −0.069; t = 1.903). Gender, education, employment, presence of children and age do not significantly affect the dependent variable.

5. Discussion

Although numerous studies have established correlation between religiosity and behavioural intention to reduce FW (Elhoushy and Jang, 2021; Minton et al., 2020; Qian et al., 2022), their results apply to household food consumption. The hedonic nature of food consumption outside the home calls for a dedicated stream of research on the effect of religion on FW reduction intention when dining out (Filimonau et al., 2022c). The current study responds to this call by showcasing that religious values of food are instrumental in activating personal norms of foodservice customers, thus prompting their intention to reduce FW.

However, contrary to the results of research on the role of religion in household food consumption, the current study finds that the influence of religious values of food on personal norms of foodservice customers is indirect as it is mediated by different values. The feeling of compassion represents the strongest mediator. This is a novel finding as this factor has never been considered in the context of FW research at home or away. By revealing compassion as a key personal norm activator, the current study outlines opportunities for its use by foodservice management and policymakers when designing interventions for FW reduction. In these interventions, foodservice providers and policymakers should emphasise the relationships between FW and hunger. For example, the following slogan can be included in marketing campaigns: *'When ordering food in our restaurant, remember that they are many people who are less fortunate than you. Please help feed this people by not wasting food'*. The power of message framing in the design of FW reduction campaigns has been recognised (Huang et al., 2021) and research has shown that properly designed slogans and messages based on empirical evidence can prompt foodservice customers to save food from
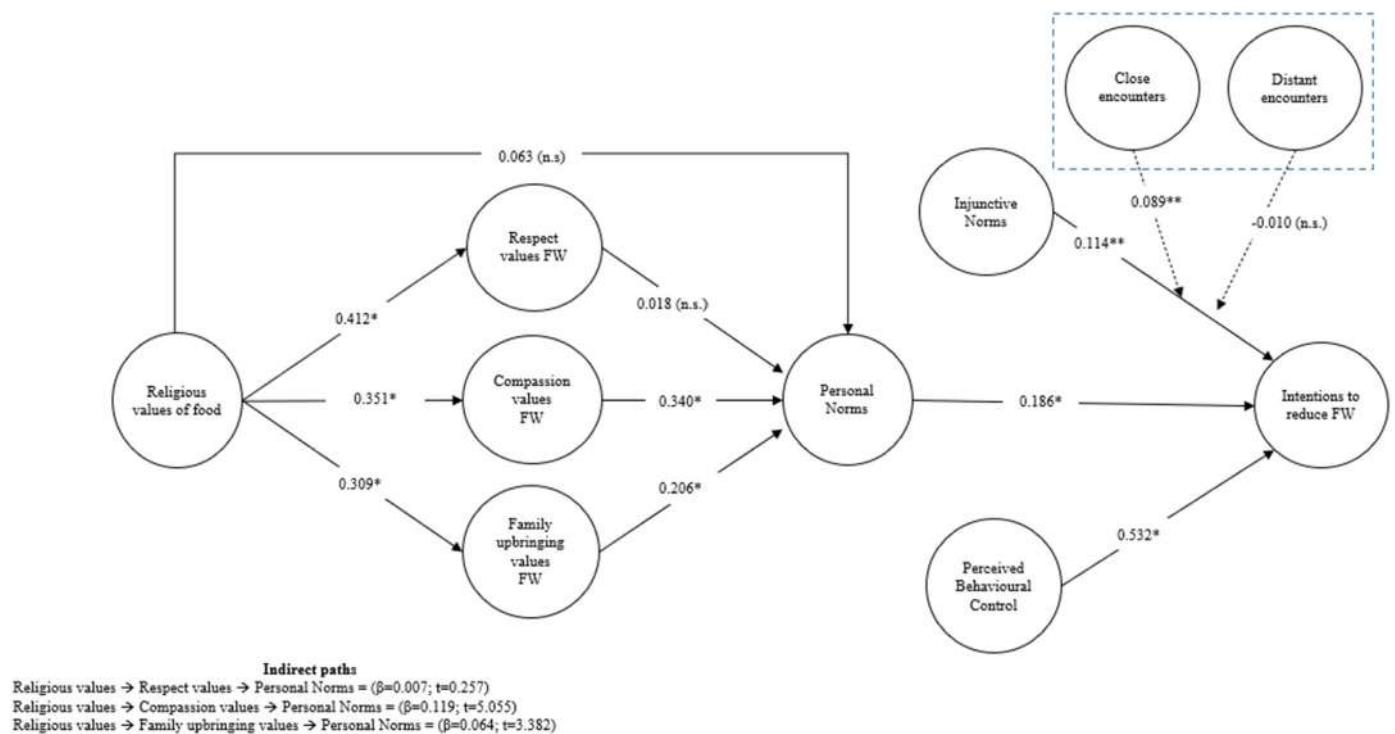

Fig. 2. Results.

going to waste (Chen and DeSalvo, 2022). This current study outlines further opportunities for the design of persuasive communication campaigns that can appeal to the religious values of foodservice customers. Such campaigns can be (more) effective in promoting FW reduction in societies with large populations of religion followers.

The current study pinpoints family upbringing as another key activator of personal norms of foodservice customers. Although the importance of family upbringing in the context of FW reduction has been highlighted in literature (Filimonau et al., 2022c; Sorokowska et al., 2020), the novel contribution of the current study is in showcasing its mediating role. Family upbringing aids in projecting the effect of religious values of food on personal norms, thus showcasing how (grand)parents can transfer values of FW reduction onto their (grand)children. This finding has implications for the design of marketing campaigns on FW reduction in foodservice provision, especially in societies with a large population of religion followers. The campaigns should remind foodservice customers that FW is a sinful act, and that (grand)parents would not approve it. For instance, the following slogan can be developed by foodservice managers and policymakers: *'Remember what your parents said about food being God's gift. Please follow your parents' and God's guidance and save food from going to waste'.*

The current study demonstrates that the feeling of respect (towards farmers' work) does not mediate the effect of religious values of food on personal norms of foodservice customers despite the relationship between religious values and respect being strong and significant (Table 5 and Fig. 2). This indicates that the effect of the Cult of Bread introduced and promoted in many communist states has now faded away, at least in Poland. This also demonstrates that foodservice customers do not associate FW with hard farmer's work despite the issues with food supply caused by COVID-19. National governments tend to emphasise resilience of their food supply chains to build consumer confidence in that food will always be available and accessible (Stone and Rahimifard, 2018). This emphasis may have played a negative role in the context of FW reduction because foodservice customers may now believe that there will be sufficient food regardless of how much FW they generate. It is argued that policymakers should change the message which broadcasts resilience of food supply chains to consumers. Instead of emphasising how easily available and accessible food is, the message should highlight how difficult it can be to produce this food and how much effort farmers and growers put in their work. For example, the following slogan can be included in marketing campaigns to appeal to the feeling of respect among foodservice customers: *'Every time when you buy food in a restaurant, remember that it has become available to you thanks to the hard work of our farmers and growers. Please pay tribute to this work by not wasting food'.*

The current study shows that, among the cornerstone elements of TPB i.e., PBC, personal norms (in place of attitudes) and injunctive norms (in place of subjective norms), PBC exerts the strongest effect on intention of foodservice customers to reduce FW while the influence of injunctive norms is the weakest (Table 5 and Fig. 2). PBC has earlier been established as the strongest antecedent of FW reduction behaviour (Elshaer et al., 2021; Russell et al., 2017) with the current study proving validity of this argument. However, empirical evidence of the role played by injunctive norms in intention to reduce FW is split i.e., although some studies find the effect of injunctive norms weak (Coskun and Ozbuk, 2020; Elhoushy and Jang, 2021; Schanes et al., 2018), some studies identify it as significant (Ertz et al., 2021; Stancu et al., 2016). The current study reinforces the former argument.

Lastly, the current study shows that social/psychological distance determines the influence of injunctive norms on intention of foodservice customers to reduce FW. This is a novel finding as research has not accounted for the proximity effect exerted by different actors on consumer norms in the context of FW. This effect is important to trigger in societies where the role of religion is insignificant or less significant than in Poland. Parents and friends represent so-called close encounters of foodservice customers which amplify the effect of injunctive norms, thus positively influencing intention to reduce FW even if foodservice customers are not religious. In contrast, such distant encounters as

fellow countrymen and residents of Europe do not influence injunctive norms, thus indicating they exert no effect on consumer intention to reduce FW when dining out.

This finding has important implications for the design of FW reduction campaigns. In these campaigns, foodservice managers and policymakers should appeal to (grand)parents and friends as the key reference groups whose opinions foodservice customers are most likely to listen to. For example, the following slogan has better chances to trigger the effect of injunctive norms on intention to reduce FW when dining out: *'Please save food from going to waste. Remember that your grandparents, parents and friends will approve this'.* The reference to (grand)parents is especially important given that this current study has demonstrated how religious values of food can activate personal norms to reduce FW via the mediating effect of family upbringing. By integrating the reference to (grand)parents in the design of FW reduction marketing campaigns, foodservice providers and policymakers can thus activate two norms at once. Personal norms will be activated by referring to (grand)parents as the key actors of family upbringing and transmitters of religious values of food from one generation to another. Injunctive norms will be activated by the reference to (grand)parents as the closest social encounters.

6. Conclusions

This study has examined the role of religious values of food and social/psychological distance as activators of norms among foodservice customers towards FW reduction. From the theoretical perspective, the study has shown the importance of religiosity in exerting direct and indirect effect on personal norms. Another theoretical contribution is in showcasing the difference in close versus distant encounters as potential amplifiers of injunctive norms.

From the practical perspective the study has outlined opportunities for the design of more effective campaigns towards FW reduction in the foodservice sector. Foodservice providers and policymakers should develop marketing campaigns in the way that these appeal to such factors as the feeling of compassion and family upbringing because these two factors have the largest potential to broadcast religious values of food as an activator of personal norms. Marketing campaigns should also incorporate reference to (grand)parents because they represent the closest encounter that can amplify injunctive norms, thus prompting foodservice customers to save food from going to waste. The multiplying effect can be achieved if marketing campaigns combine the reference to family upbringing and close encounters given that (grand)parents are key to both factors.

From the policymaking perspective, this study has demonstrated the need for national government and local authorities in Poland and other countries with large populations of religion followers to integrate religious values of food in teaching curricula to encourage FW reduction. This integration can be especially effective at the level of nurseries/kindergartens and primary schools as younger children are most likely to absorb these values, and it is therefore more probable that they will follow these values when they grow up. Further, policymakers in Poland and beyond should capitalise upon the proximity effect detected in this current study and integrate it in educational campaigns on FW reduction. By referring to (grand)parents and close friends, such campaigns can be more effective when encouraging (younger) consumers to save food from going to waste when dining out.

From the methodological perspective, the study has developed, tested and validated new measures on such antecedents of FW reduction behaviour as the feeling of compassion, family upbringing, religious values of food, close and distant encounters. These measures can be used in future research on FW behaviour at home and away. The measures should be validated in other geographical and socio-cultural contexts to reconfirm their validity.

Like any study, this one has limitations which concurrently represent promising research opportunities. The results are only representative of the market of out-of-home food consumption in Poland. Although Polish society is very religious, subsequent validation is necessitated in other

countries where religion plays a significant role. This should include other religious denominations within Christianity, such as Eastern Orthodox, Anglicanism, and the many varieties of Protestantism, but also other religions, such as Judaism, Islam, and Buddhism. This study has only considered opinions of foodservice customers and future research should integrate perspectives of foodservice providers, policy-makers, specialists in family upbringing, and religious leaders in analysis. Such integration can enhance interpretation of this study's findings and aid in the design of more effective marketing campaigns for FW reduction. Lastly, a cross-generational study is warranted. This future study should look at perceptions of FW and the need for its reduction among the representatives of different generations. Future studies should examine the mechanisms behind the transfer of religious values of food from one generation to another. Knowledge of this transfer can enable a better understanding of the various roles played by different generations in developing values and norms towards FW reduction at home and away.

CRediT authorship contribution statement

Viachaslau Filimonau – Conceptualization, Data curation, Formal analysis, Writing – Original draft.
Jorge Matute - Conceptualization, Formal analysis, Writing – review and editing.
Magdalena Kubal-Czerwińska - Conceptualization, Data collection, Writing – review and editing.
Mirosław Mika - Conceptualization, Project administration, Data collection, Formal analysis, Writing – review and editing.

Data availability

Data will be made available on request.

Declaration of competing interest

The authors hereby declare no conflict of interest.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.scitotenv.2023.161645.

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