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To Be Ethical or to Be Good? The Impact of Good Provider and Moral Norms on Food Waste Decisions in Two Countries

Abstract

One-third of all food produced in the world is lost or wasted, which has negative consequences for societies and the environment. Thus, curbing food waste is critical to securing human well-being and protecting the environment. This study examines the drivers of household food waste decisions by investigating the activation and deactivation of moral norms and introducing the concept of the 'good provider' in an augmented norm-activation model (NAM). A survey of 643 consumers in Australia and Singapore explores the good-provider norm as a driver of food waste behaviours in both cultures. For Australians, good-provider norms suppress intentions to avoid food waste, most likely to provide for the immediate family, a motive that overrides moral concern about food waste in an individualistic culture. For Singaporeans, good-provider norms do not suppress food waste intentions, possibly due to the value placed on thrift by a long-term-oriented culture. The paper significantly extends the previous research on norms, culture and sustainable consumption, and provides policy and practical implications for curbing food waste in different cultural contexts.

Keywords: Food waste; moral norms; good provider; cross-cultural consumption

1. Introduction

Research on environmentally and socially responsible consumption has increased rapidly since the early 2000s (Carrigan, 2017). Whereas most prior studies focus on the food acquisition stage, our study responds to the call for expanding the scope of ethical and sustainable consumption research to the usage and disposal stages as well (Prothero et al., 2011; Lim, 2017). In this context, household food waste – the reduction of which is central to the transition to a circular economy – is an important area of sustainable consumption (Jurgilevich et al., 2016). Therefore, this study focuses on household food waste because at a consumer level, households are the sector with the highest proportion of wasted food, followed by food services and retail (UNEP, 2021). Household food waste is the consequence of overconsumption (Pearson et al., 2013) and forms part of an unsustainable consumption cycle (Gjerris and Gaiani, 2013).

A study by Gustavsson et al. (2011) estimates that one-third of all food produced in the world for human consumption is lost or wasted, and this waste is responsible for an estimated 8–10% of global greenhouse gas emissions (Mbow et al., 2019). The full cost of food wastage worldwide was calculated to be US$ 2.6 trillion (FAO, 2014); in Australia, for example, 9% of the total water use and 6% of greenhouse gas (GHG) emissions are associated with the production of food that is ultimately wasted (Reutter et al., 2017). All these include major negative impacts on the environment (Papargyropoulou et al., 2016), the economy (Buzby and Hyman, 2012) and on society through their effect on people's livelihoods (Aschemann-Witzel et al., 2015; FAO, 2014). Hence, an intersectional and interconnected approach incorporating natural science, food technology and social science is needed to reduce food waste and its negative externalities to levels that are within the planetary boundaries of resource use (Alexander et al., 2019; Bijl et al., 2017; Steffen et al., 2015).

In the last two decades, food waste has received increased attention in the natural science arena in the exploration of various technologies, processes and products to treat and reduce food waste (Chen et al., 2017). A social science perspective is equally important, given that technology-based solutions to food waste may fail if the social and psychological drivers of food waste are not well understood. However, although understanding consumer behaviour is imperative to tackling food waste (Vilariño et al., 2017), research on food waste from the consumer's perspective using behavioural theories is but a recent development, and the factors underlying food waste behaviour are still under discussion (see Aschemann-Witzel et el., 2018; Papargyropoulou et al., 2016; Secondi et al., 2015). In this context, previous studies suggest that moral norms are an effective mechanism for curbing food waste, but also observe that various factors may suppress those moral norms (Stancu et al., 2016; Stefan van Herpen et al., 2013). Aschemann-Witzel et el. (2018) call on researchers to further investigate the role of moral norms in food waste behaviours. Thus, the objective of this study is to understand the effect of moral norms on food waste decisions and to investigate the factors that activate and deactivate these moral norms.

To address the research objective, we apply an augmented norm-activation model (NAM) (Schwartz and Howard, 1981) to food waste decisions. First, this model treats moral norms as a core predictor of pro-social behaviour. The NAM was originally applied to altruistic or helping behaviours; however, it can also be applied to food waste, given the moral dimensions attached to wasting edible food (Gjerris and Gaiani, 2013; Stancu et al., 2016). Second, the NAM shows that moral norms are shaped by broader societal norms in the context of social interactions (Schwartz and Howard, 1981). Therefore, it is critical to consider the social embeddedness of ethical and sustainable consumption practices (Kjærnes, 2012). In this study, we explore the 'good provider' social norm, which qualitative research has identified as influencing food consumption and food waste behaviour (Graham-Rowe et

al., 2015; Porpino et al., 2016; Visschers et al., 2016) and investigate whether, and how, this particular norm may suppress the activation of moral norms.

Empirically, our study focuses on Australia and Singapore because they represent distinct cultures (Hofstede et al., 2010) whose citizens tend to generate high food waste. Australian households throw away around 102 kg of food per capita each year (Arcadis, 2019), while in Singapore an estimated 80 kg of food is wasted per capita annually (UNEP, 2021). Our results, based on survey data from 328 consumers in Australia and 315 consumers in Singapore, make several novel contributions to ethical and sustainable consumption literature. First, although research has tested the applicability of NAM under different pro-social behaviours, it has devoted little attention to applying it to food waste contexts. This study is thus the first to test the mechanism by which moral norms are activated and influence food waste behaviour. Second, by incorporating good-provider norms as one suppressor, we unpack the circumstances under which moral norms are deactivated in influencing ethical and sustainable consumption behaviour, thus augmenting the NAM. Third, according to Sharma and Jha (2017), sustainable behaviours differ across cultures due to their different underpinning values and beliefs, and this poses a great challenge to policy makers and social marketers who seek to promote these behaviours. However, cross-cultural studies on reducing food waste are still scarce and in high demand (Porpino, 2016; Aschemann-Witzel et al., 2018). By examining the applicability of NAM in two distinct cultures (Hofstede et al., 2010), our study helps overcome the geographic fragmentation of sustainable consumption research and provides insight into what practitioners and policy makers can do to curb food waste.

2. Literature Review and Hypotheses Development

2.1. The NAM

Several theories can explain the factors influencing ethical and sustainable behaviour. Studies have applied the theory of planned behaviour (TPB) to food waste (Graham-Rowe et al., 2015; Pakpour et al., 2014; Stefan et al., 2013), which posits that attitudes, subjective norms, and perceived behavioural control can predict intentions (Ajzen, 1991). The TPB typically stresses the utility concern of consumers (i.e. cost–benefit analysis), and omits moral norms, although it does capture external norms (subjective norms). Moral norms reflect the idea that people behave in a certain way because they believe it is the right thing to do; that is, they feel morally obligated to act pro-environmentally (Stern, 2000). In the food waste context, moral aspects trigger feelings of guilt or concern when throwing away edible food (Hamilton et al., 2005; Stefan et al., 2013). Such a moral foundation of harm/care is significantly related to sustainably minded food consumption/disposal (Minton et al., 2018).

A few studies on food waste have incorporated the moral element but report conflicting findings about its effect on food waste decisions. Stancu et al. (2016) and Aschemann-Witzel et al. (2018) find that moral norms do not significantly influence the intention to reduce food waste, whereas Stefan et al. (2013), in their study of Romanian households, show that concern and guilt about wasting food are significantly related to intentions to avoid food waste. They conclude that the amount of food wasted is largely shaped by food planning and shopping routines, which are themselves determined by moral attitudes toward food waste and perceived behavioural control. Aschemann-Witzel et al. (2018) suggest that in some countries, moral norms do not seem to have a significant influence on food waste behaviours, mainly because the food waste problem has not received enough attention in those countries. This argument supports the importance of understanding cultural differences among countries and their impact on food waste attitudes and behaviours.

To address these conflicting studies, our conceptual framework is based on the NAM, which includes several variables to predict ethical behaviours. The first variable is moral norms, defined as a 'moral obligation to perform or refrain from specific actions' (Schwartz and Howard, 1981, p. 191). The second, awareness of consequences (AC), describes whether someone is aware of the negative consequences for others, or for things one values, when not acting pro-socially. The third, ascription of responsibility (AR), represents feelings of responsibility for the negative consequences of not acting pro-socially.

2.2. The Importance of Culture

Culture can have an impact on personal values, norms and consequent behaviours (Hofstede, 2003). Moral norms are fundamentally influenced by cultural, institutional and socio-economic structures (Chatzidakis et al., 2018; Pekerti and Arli, 2017) and therefore differ across cultures (Hofstede, 2003).

While many models measure cultural dimensions, research has extensively used Hofstede's (2003) model to interpret differences across countries in the area of consumer ethics and sustainable consumption (e.g. Gentina et al., 2016; Minton et al., 2018; Sharma and Jha, 2017; Yin et al., 2018). Swaidan (2012) found significant differences in ethics between consumers who score high and low on Hofstede's cultural dimensions. These studies support our decision to seek to understand the difference in food waste decisions between Australians and Singaporeans using ethics-related cultural dimensions, as the two countries differ on all these and therefore provide a good context for meaningful comparisons.

These cultural dimensions include: power distance, uncertainty avoidance, individualism/collectivism, masculinity/femininity and long-term/short-term orientation (Hofstede et al., 2010). 'Power distance' refers to the extent to which a culture accepts authority, hierarchy, and power. 'Uncertainty avoidance' pertains to a society's tolerance for uncertainty about the future. 'Individualism' refers to societies in which people are mainly

concerned with and look after themselves and their immediate family, whereas 'collectivism' represents a society in which people feel that they belong to larger in-groups or collectives. 'Masculine' societies are those that prefer assertiveness and personal goal achievement, whereas 'feminine' cultures focus on nurturing relationships, helping others, and the physical environment. 'Long-term orientation' refers to cultures that focus on future rewards, whereas countries evincing 'short-term orientation' focus on the past and present.

According to the study by Hofstede et al. (2010), Australia, which belongs to the Anglo country group (House et al., 2004), is classified as low in power distance, high in uncertainty avoidance, high in individualism, masculine, and short-term-oriented. Conversely, Singapore, a member of the Confucian Asia cultural group (House et al., 2004), is classified as high in power distance, low in uncertainty avoidance, high in collectivism, marginally feminine, and long-term-oriented. Consequently, we expect these countries to deal with food waste differently.

2.3. Activation of Moral Norms: AC and AR

According to NAM (Schwartz and Howard, 1981), AC and AR are pre-conditions for the activation of norms. In general, NAM posits that if people are conscious that their behaviour (e.g. wasting food) brings negative consequences to others and to the natural environment (AC), they may feel responsible for any negative effects and therefore engage in environmentally responsible behaviour to help alleviate the problems (AR), which in turn will activate their moral norms (Heath and Gifford, 2002; Liu et al., 2017; Steg and De Groot, 2010).

Within this mechanism, feelings of moral obligation can be easily trivialized (Lindenberg and Steg, 2007) if AC is low, especially in the context of food waste, which can only be alleviated through collective action (Steg and De Groot, 2010). Various studies acknowledge

that food waste is a global problem – as well as an integral part of world agricultural systems, food supply chains and society overall – for which there are no simple solutions (Chaboud and Daviron, 2017; Matthes and Matthes, 2018). Consumers do not always make a causal connection between their actions in the home and global issues such as climate change and world hunger. For example, a U.K. study conducted by the Waste and Resources Action Program (WRAP) revealed that consumers are more inclined to attribute responsibility for the food waste problem to retailers and the business sector rather than to themselves (WRAP, 2007). Devin and Richards (2018) highlight the powerful role of supermarkets in generating waste in the supply chain through their rigid cosmetic standards, which might lead consumers to blame retailers for the food waste problem. Gjerris and Gaiani (2013, p. 20) argue that the food waste problem must be grounded in people's everyday lives; otherwise, a sense of personal responsibility disappears – and hence, feelings of moral obligation – will likely be low. In this sense, we hypothesize that AR will at least partially mediate the effect of moral norms and awareness of food waste consequences. In other words, consumers' AC of food waste is the first step toward feeling responsible for solving the problem through their own actions (AR), which in turn activates their personal moral norms. Thus:

Hypothesis 1a. AC of food waste leads to higher AR.

Hypothesis 2a: AR has a positive effect on moral norms.

The dimensions of power distance and collectivism/individualism described by Hofstede et al. (2010) may help explain H2a between Australia and Singapore. These two dimensions are closely related to Rotter's (1966) locus of control (LOC). LOC refers to the extent to which people believe that they have control over the outcomes of events in their lives (internal LOC), as compared with external forces, which are beyond their control (external LOC). Compared with Singapore, Australia scores higher on individualism (90 vs 20) and

lower on power distance (36 vs 74), which according to Smith et al. (1995) is linked to high internal LOC. Correspondingly, Smith et al. (1995) find that Singapore scores higher on external LOC (10.58) than Australia (8.23). With a higher internal LOC, Australian households are more likely to believe that 'individual action' can make a difference and to feel responsible for making such differences. Having a sense of control over a situation, or an internal LOC regarding the environment, will affect moral reasoning and pro-environmental behaviour (Gifford and Nilsson, 2014; Kalamas et al., 2014). Thus:

Hypothesis 1b: The positive relationship between AC of food waste and AR is stronger among Australians than Singaporeans.

The relationship between AR and moral norms may also differ between the two countries. On the one hand, Australia's high masculinity (61) leads to lower idealism. Thus Australians believe that 'individuals should act in ways that are consistent with moral rules, but one should remain pragmatically open to exceptions to these rules' (Forsyth et al., 2008, p. 815). This implies that AR may not lead to strong moral norms because people believe there is room for deviation from ethical behaviour. A long-standing challenge in reducing food waste is that most people do not perceive themselves as wasteful, thus reducing their motivation to act ethically (WRAP, 2015). Singapore scores lower on this dimension (48); therefore, Singaporeans who believe their behaviour matters in reducing negative consequence for others (high AR) will likely have a stronger sense of moral norms than Australians.

On the other hand, due to high power distance, Singaporeans with higher AR may not necessarily end up with higher moral norms activation because of their reliance on authority to provide guidance on what is right or wrong and thus shape personal moral norms from above. Concurrently, in collectivist societies, individuals are more likely to follow the

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prescriptive over personal moral norms (Thorne and Saunders, 2002). Research suggests that collectivists are more likely to obscure personal causal agency by mitigating perceived responsibility for their actions (Mazar and Aggarwal, 2011). In this case, Singaporean's AR will be mitigated by the group norms, leading to weaker impact on personal moral norms. In contrast, Australia's low power distance and high individualism means that people will make their own judgments before developing their set of moral norms. Therefore, Australians with high AR will likely feel more empowered to act than Singaporeans, leading to a stronger sense of fulfilling their moral obligation.

These opposing factors lead to inconclusive results in terms of the strength of the AR-moral norms relationship between the two countries. Udo, Bagchi and Maity (2016), when examining digital piracy, found no differences between the relationship of AR and moral norms in two countries (US/India) with similar differences in collectivism and power distance scores to our study. Therefore, we hypothesize:

Hypothesis 2b. There is no significant difference between Australia and Singapore in terms of the positive relationship between AR and moral norms.

2.4. Moral Norms and Food Waste Decisions

Moral obligation refers to an individual's perception of the moral correctness or incorrectness of performing a behaviour (Ajzen, 1991). Even in a 'throwaway' society (Evans, 2012), food is different from other consumer products and taboos about throwing away good food exist, perhaps in all cultures (Gjerris and Gaiani, 2013). As a result, food waste has a highly normative character (Matthes and Matthes, 2018). Chaboud and Daviron (2017, p. 3) define 'waste' as having moral overtones and 'food waste' as having 'an underlying negative and deliberate connotation'. Ample evidence shows that consumers feel guilty, uncomfortable, or bothered to some extent if they waste food (Hamilton et al., 2005;

Stefan et al., 2013), due to the perceived value of food itself (Graham-Rowe et al., 2015; Watson and Meah, 2012). Several scholars link moral judgments to food waste avoidance (Gjerris and Gaiani, 2013; Stancu et al., 2016) and Romani et al., (2018) report that a 'virtuous' segment scoring high on moral norms wastes the least food. Therefore, we hypothesize:

Hypothesis 3a. Moral norms have a direct positive effect on intention to reduce food waste.

Studies have shown differences between Asian and Western countries in environmental beliefs, knowledge, and behaviours (Aoyagi-Usui et al., 2003; Wang and Kuah, 2018). In our study, on the one hand, Singapore scores higher on power distance than Australia (Hofstede et al., 2010), implying that Singaporeans are more likely to follow rules to preserve societal stability and less likely than Australians to question the ethical dimensions of their actions. Singapore also scores much lower on uncertainty avoidance than Australia (8 vs. 51); according to Swaidan (2012), countries low on uncertainty avoidance tend to be more accepting of immoral activities than countries high on uncertainty avoidance. In addition, many studies have found that collectivist societies are more tolerant of deviations from moral norms than individualistic societies (e.g. Bernardi and Long, 2004; Tavakoli et al., 2003). These three cultural dimensions could imply a weaker relationship between moral norms and food waste reduction intentions in Singapore compared with Australia.

On the other hand, research also shows that masculine cultures are less ethical than feminine societies, as they show more greed and competitiveness (Swaidan, 2012). Singapore scores lower on the masculinity dimension than Australia (48 vs. 61), and thus the relationship between moral norms and intentions to reduce food waste is likely to be stronger in Singapore than in Australia due to feminine societies' focus on protecting the environment, enhancing quality of life, and helping others (Hofstede et al., 2010). Considering these

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differences, it is difficult to predict which society will demonstrate a stronger relationship between ethical norms and higher intentions to reduce food waste. Thus, we hypothesize:

Hypothesis 3b. There is no significant difference between Australia and Singapore in terms of the positive relationship between moral norms and intention to reduce food waste.

2.5. Deactivation of Moral Norms: Good-Provider Norms

Using an ethnographic approach, Evans (2012) highlights the role of social norms in contributing to food waste. One such social norm is that of the 'good provider', or the desire to show hospitality and provide plenty of food to one's family and friends. Various scholars argue that a 'good provider' mentality or a 'good mother' identity is a barrier to tackling the food waste problem (Aschemann-Witzel et al., 2015; Graham-Rowe et al., 2015; Porpino et al., 2016; Visschers et al., 2016). However, there is little evidence that good-provider norms can successfully predict food waste behaviour.

Good-provider norms may result from diverse motivations and role expectations. For example, to be a 'good parent' when preparing food, consumers feel the need to consider other people's tastes and preferences, nutritional requirements, and the fluctuating appetites of children. Such a mindset can lead to an abundance, or even overprovision of foods (Evans, 2011; 2012). Good-provider norms may also manifest in showing hospitality to guests. The norm of being a good host could lead to over-preparation of food, out of fear that not serving enough, or serving the wrong foods, might result in embarrassment (Graham-Rowe et al., 2015; Porpino et al., 2016; Visschers et al., 2016).

The overprovision of food due to good-provider norms results not only in excess food being consumed to reduce food waste (termed 'virtuous plate-clearing'), which may cause overconsumption of calories, obesity and associated health problems (Alexander and Moran,

2017), but also produces excess food that is at risk of being thrown away (Evans, 2011; 2012).

Good-provider norms may also dampen the relationship between moral norms and intention to reduce food waste. As good providers for the family and guests, individuals will likely prioritize the wellbeing of their family or guests and believe food waste to be unavoidable, or even a 'necessary evil'. Thus, even when people feel guilty or bothered about food waste (moral norms), their intention to reduce food waste will be weakened. This can be explained by the notion of conflicting norms (McDonald et al., 2013). Personal norms to avoid waste may conflict with social norms, such as the norm to provide large amounts of food, and a variety of food, to guests to celebrate special occasions. In this sense, good-provider norms are used as a neutralization tactic (Chatzidakis et al., 2007), intentionally or unintentionally, to justify over-provision and food waste, thereby alleviating people's negative feelings of wasting food and deactivating the influence of moral norms. Thus:

Hypothesis 4a. Good provider norms have a direct positive effect on the amount of food thrown away by households.

Hypothesis 5a. Good provider norms negatively moderate the positive relationship between moral norms and food waste intentions.

Cultural differences are likely to affect the extent to which moral norms are deactivated by good-provider norms. In collectivist societies such as Singapore, people are loyal to strong and cohesive groups, with any transgression of norms leading to feelings of shame. Instead, harmony occurs when everyone has a sense of dignity, and prestige and social relations are developed and maintained in such a way that everyone saves face (Hofstede et al., 2010). Face consciousness can lead to consumption (and disposal) differences between Confucian and Western societies (Wang et al., 2018; Wong and Ahuvia, 1998). This greater concern for

saving face in Confucian countries increases the emphasis on publicly visible possessions than in Western cultures (Bao et al., 2003), as the social identity is developed by meeting the expectations of important others (Li and Su, 2007). For example, in China, the provision of luxury foods at extravagant banquets is a marker of 'face' (He et al., 2016). Similarly, we expect people in Singapore to be influenced more by their role as good providers to gain social status and maintain face (e.g. providing enough food for their guests), which can lead to increased food waste, but only on special occasions. By contrast, we expect Australians, who tend to be highly individualistic, to be influenced by their good-provider role in their immediate family context, which can lead to high food waste on a daily basis, forming a stronger relationship overall between the good-provider role and food waste intentions and behaviour compared with Singapore.

Confucian countries have a long-term orientation (Hofstede, 2003) and Singapore's high long-term orientation (72) is reflected in qualities such as perseverance, sustained efforts, slow results, thrift, and being sparse with resources. By contrast, Australia's low score (21) on this dimension shows a short-term-oriented culture that has respect for traditions and exerts little effort to save for the future. Therefore, it is expected that people in Singapore will demonstrate a better way of organizing their resources, leading to weaker relationship between any efforts to be "good providers" and food waste intentions and behaviour. We present our conceptual model in figure 1.

Hypothesis 4b. The relationship between good provider norms and food waste behaviours is stronger for Australians than Singaporeans.

Hypothesis 5b. The good provider norms dampen the positive relationship between moral norms and food waste intentions to a greater extent in Australia than in Singapore.

-------Insert Figure 1 about here-------

3. Method

3.1. Data Collection

We collected data through a survey developed using Qualtrics software in Australia and Singapore in April 2018. The survey contained several measures, including food waste intentions, moral norms, AC, AR and good-provider norms, as well as demographic information. The survey explained that 'food waste' referred to food thrown away in the rubbish bin, the organic bin or the compost, as well as food given to pets – and did not include inedible materials such as bones, vegetable peelings, or egg shells (Visschers et al., 2016).

Most of the respondents were recruited through an online panel (Walter et al., 2018) provided by a leading professional research agency, Qualtrics, which continually performs quality assurance procedures. To ensure a representative, diverse and comparable sample across the two countries, we used gender, age and income as quotas. To achieve the quotas, a minority of respondents were recruited from the street in Singapore. As a reward for their participation, the respondents received payment from Qualtrics (for the online panel participants) or a voucher that could be exchanged for products in the local supermarket in Singapore (for those recruited outside of the online panel). Ethics approval for the study was secured from the ethics committees at the authors' respective universities *[details removed for peer-review].* After removing outliers and responses with missing data, we had 328 and 315 responses from Australia and Singapore, respectively. The demographic information of respondents in both countries is presented in Table 1.

-------Insert Table 1 about here-------

3.2. Measures

Regarding respondents' self-reported food waste behaviour, we modified the measures in Stefan et al. (2013) and Romani et al. (2018) to estimate the amount of food they perceived they had thrown away in the last seven days. For all the other main variables, we used multi-item scales from extant literature and tested the constructs (Table 2). To achieve the best possible quality, we selected items with high Cronbach's alphas from previous studies on the NAM. Prior research has extensively tested the construct validity of these dimensions and found the factor structures to be stable across cultures and over time (Scholderer et al., 2004), although we adapted the survey to suit an Asian culture (Grunert et al., 2011). For those items, the instructions included: 'Please rate your level of agreement or disagreement with the following statements'. The response format was a seven-point Likert scale, which is typically used in the literature (Grunert et al., 2001).

-------Insert Table 2 about here-------

3.3 Validity Test

3.3.1. Convergent validity. An exploratory factor analysis (EFA) shows all items loaded significantly ($p < .001$) onto their corresponding factors (higher than .60), with the Cronbach's alpha value for each construct above 0.60 (Moss et al., 1998). We also assessed composite reliability (CR), which is a less biased estimate of reliability than Cronbach's alpha because it normally assumes that all items contribute equally to their latent variable without considering the actual contribution of each individual loading (Götz et al., 2010). All our constructs had CR values higher than the threshold of 0.6 suggested by Tseng et al. (2006) (Table 2). Therefore, convergent validity of the constructs is established.

3.3.2. Discriminant validity. Discriminant validity establishes when measures are not a reflection of some other variables; it is indicated by low correlations between the measure of interest and the measures of other constructs (Cheung and Lee, 2010). We conducted partial least squares (PLS) and found the average variance extracted for each factor was greater than the square of the correlation estimates of the factor with all other constructs (Tables 3a and 3b). We thus can conclude that the measures show sufficient discriminant validity (Fornell and Larcker, 1981). Taking all these indicators into account, we are confident that the measurement model is satisfactory for both countries.

-------Insert Tables 3a & 3b about here-------

4. Empirical Analysis

We tested the model presented in Figure 1 using AMOS 20 with maximum likelihood estimation. The sample size of 328 Australian consumers and 315 Singaporean consumers was sufficiently large, with 19 indicators in the model, given that the suggested sample size for structural equation models (SEM) should be at least 200 (Kline, 2005) or 10 observations per indicator variable (Nunnally, 1978).

4.1. Descriptive Statistics

We first compared the examined variables of the households in Australia and Singapore. Table 4a shows that households in Singapore reported a higher amount of food waste than those in Australia. They also reported higher AC of food waste but lower AR and intention to reduce food waste than those in Australia. Regarding moral norms and good-provider norms, the two countries did not show significant differences. Tables 4b and 4c present the correlation matrix for both samples.

-------Insert Tables 4a, 4b & 4c about here-------

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4.2. SEM Estimation Results

As all variables were latent and we needed to test the moderation effect, we chose moderated structural equation modelling (MSEM) as the preferred approach in place of regression analysis. This is because moderated regression analysis limits the researcher to investigating one dependent variable at a time and can lead to both the loss of statistical power as reliability decreases (Aiken et al., 1991) as well as biased coefficient estimates (Ping, 1995). We adopted Ping's (1995) approach to MSEM using the three steps described in Cortina, Chen and Dunlap (2001).

Table 5 presents the results from testing the two competing conceptual models. The models converged well and had satisfactory goodness of fit. The model based on the Singapore data had the best goodness-of-fit indicators; that is, CFI and IFI were above the strictest threshold value of .95, RMSEA was lower than the strictest cut-off point of .05 (Hu and Bentler 1999; MacCallum et al., 1996), and SRMR was less than 0.08 (Hu and Bentler, 1998). The other model, based on Australia, had slightly lower fit indices, though they were still acceptable (MacCallum et al., 1996). The only unsatisfactory model fit indicator was chi-square. However, considering the complexity of our model due to the number of indicators involved (Cortina et al., 2001; Hair et al., 2010), this high value was not surprising and was comparable to that seen in other studies (e.g. Liao et al., 2009; Nishii et al., 2008).

-------Insert Table 5 about here-------

4.2.1 Activation of moral norms. As Table 5 shows, AC is positively related to AR (Australia: $\beta = 0.664$, $p < 0.001$; Singapore: $\beta = 0.307$, $p < 0.001$), in support of H1a. AR is positively related to moral norms (Australia: $\beta = 1.037$, $p < 0.001$; Singapore: $\beta = 1.557$, $p < 0.001$), in support of H2a. As Table 5 shows, moral norms positively influence households' intention to reduce food waste (Australia: $\beta = 0.936$, $p < 0.001$; Singapore: $\beta = 1.203$, $p <$

0.001), in support of H3a. In addition, we found that households with a higher intention to reduce food waste produce less food waste (Australia: β = –6.758, $p < 0.001$; Singapore: β = –5.176, $p < 0.001$). These results provide full support for the NAM prediction for both countries, indicating that moral norms are enhanced when households perceive the consequences of food waste and their own responsibility for its reduction. In turn, moral norms enhance households' intentions to reduce food waste, which leads to less food waste.

The results also reveal some differences between Australia and Singapore. The multi-group analysis in AMOS shows that the effects of AC and AR are greater in Australia than in Singapore ($p = 0.012$), in support of H1b. The effect of AR on moral norms and the effect of moral norms on food waste intention are not significantly different between the Singapore and Australia samples; thus, H2b and H3b are supported.

4.2.2 Good provider norms as deactivator for moral norms. Table 5 shows that good-provider norms have a strong positive effect on the amount of food waste in both the Australia (β = 8.381, $p < 0.001$) and Singapore (β = 7.401, $p < 0.001$) samples, in support of H4a. However, this effect does not show significant differences across the two samples, thus failing to support H4b. In addition, in Australia, good-provider norms have a negative effect on intention to reduce food waste (β = –0.249, $p < 0.01$). The interaction between food provider norms and moral norms is negatively related to intention to reduce food waste (β = –0.701, $p < 0.05$). These results lend support to our prediction in H5a that good-provider norms weaken moral norms' influence on the intention to reduce household food waste. In Singapore, neither good-provider norms (β = 0.147, $p > 0.05$) nor the interaction between good-provider norms and moral norms (β = 5.717, $p > 0.1$) is significantly related to households' intention to reduce food waste. The effect of good-provider norms on intention to reduce food waste differs significantly between the Australia and Singapore samples, in

both its main effect ($p = 0.001$) and its interaction with moral norms at a marginal level ($p = 0.092$). These results support H5b.

4.2.3 Robustness test. We conducted an SEM with PLS path modelling. The results were consistent with the SEM results. We also conducted instrumental variables (IV) regression using Stata, as this approach allows us to control for other variables' influence on intention to reduce food waste and food waste amount. To implement the IV regression, we must identify one or more instruments, which must be exogenous (uncorrelated with errors) but correlated with the endogenous variable. In the first stage, we used AR, AC, frugality orientation (Grunert et al., 2001), moral norms, good-provider norms, and the interaction of the last two variables to predict intention to reduce food waste. Frugality orientation served as a valid instrument as it was significantly correlated with intention to reduce food waste (correlation = 0.38; $p < 0.001$) but not with food waste amount (correlation = –0.0517; $p > 0.1$). In the second stage, we used the predicted value of intention to reduce food waste to regress the food waste amount, together with other control variables. We controlled for demographic variables that have been found to influence food consumption decisions in previous studies. These include income (Stancu, Haugaard and Lähteenmäki, 2016; Koivupuro, 2012), gender (Visschers, Wickli and Siegrist, 2016), age group (Schanes, Dobernig and Gözet, 2018; Secondi, Principato and Laureti, 2015), education (Jörissen et al., 2015), employment status (Mattar et al., 2018), household size (Koivupuro, et al., 2012) and number of children in household (Parizeau et al., 2015), as well as other variables such as shopping and planning routines (Grunert et al., 2001) and convenience orientation (Aschemann-Witzel et al., 2018). The results in Table 6 are generally consistent with those from our main model in Table 5.

-------Insert Table 6 about here-------

To further illustrate the moderating effect of good-provider norms, we plotted the relationship between moral norms and the intention to reduce food waste based on the first-

stage IV regression, using one standard deviation below and above the mean of good-provider norms, in Figures 2a and 2b, respectively. Figure 2a shows that in the Australia sample, for the respondents with high good provider norms, moral norms has a very weak positive influence on their intention to reduce food waste, whereas for those with low good-provider norms, moral norms has a much stronger positive influence on their intention to reduce food waste. Figure 2b shows that for the Singapore sample, moral norms always positively influence respondents' intention to reduce food waste, but the influence is stronger for those with low (rather than high) good-provider norms.

-------Insert Figures 2a & 2b about here-------

5. Discussion

The goal of this study was to examine the factors associated with household waste behaviours in the context of the NAM. Our results support the NAM, indicating that people who are aware of the consequences of food waste (AC) feel more responsible for solving the food waste problem through their own actions (AR), which then activates their moral norms toward food waste, leading to higher intentions to reduce their household food waste and, consequently, lower food waste. The findings are consistent with prior studies showing that consumers feel guilty about wasteful behaviour (e.g. Bolton and Alba, 2012; McCarthy and Liu, 2017) and have particularly emotional or visceral reactions to food waste (Evans, 2012), thus proving that food waste carries moral and ethical implications. The findings also provide further evidence that moral obligation is a strong predictor of household waste intention (Ajzen, 1991; Stefan et al., 2013) and behaviour (Pakpour et al., 2014).

Next, we set out to examine cultural differences in the context of the NAM. The analysis shows that AC of food waste has a stronger effect on AR in Australia than in Singapore. This could be explained by external LOC (Rotter, 1966), which is an attribute of individualist

societies with low power distance, such as Australia. Conversely, Singapore is a 'semi-authoritarian state' (Ho, 2008), and environmentalist attitudes and practices are to some extent shaped by the government. During the past decade, a shortage of available land for landfills and the escalating cost of incineration platforms have compelled the Singaporean government to promote food waste reduction programs (Lang, 2005). Thus, Singaporeans, who score high on power distance, may be inclined to ascribe responsibility for the food waste problem to the government.

We found no significant differences between the two countries in the relationship of AR and moral norms with food waste intentions, which is consistent with a previous study on digital piracy decisions (Udo et al., 2016) and could be attributed to the close similarity between the two cultures in their sense of responsibility on moral norms (Swaidan, 2012).

In addition, we investigated the impact of good-provider norms on food waste behaviour. The analysis shows that these norms have a strong positive effect on the reported amount of food wasted in both samples. The results are consistent with prior research showing that expressions of hospitality through food are central to the social fabric of most societies and that good-provider norms, along with socio-cultural factors, help explain food waste behaviour (Graham-Rowe et al., 2015; Porpino et al., 2016; Roodhuyzen et al., 2017). Hospitality norms appear to conflict with the frugality norm and are therefore linked to less sustainable consumption (Evans, 2011).

We then investigated the role of good-provider norms and how they interact with moral norms in the NAM model. Such focus on the co-existence of good-provider norms and moral norms could shed light on how consumers in different cultures deal with conflicting norms. Our results suggest that for Australian consumers, intentions to minimize food waste that arise from guilt about wasting food have been dampened by the strong good-provider norms. Such findings lend support to the rationalization strategies related to unethical behaviour

(Howie et al., 2018; Paharia et al., 2013). That is, Australian respondents may use good-provider norms to justify their overprovision of food and food waste. This is similar to the appeal to higher loyalties ('To some what I did may appear wrong, but I did it for my family'), which is one of the neutralization tactics people use to reduce their guilt when doing something immoral (Chatzidakis et al., 2007).

In Singapore, good-provider norms do not moderate the relationship between moral norms and intentions not to waste food. This can be explained by Singaporeans' culture and need to maintain social status/face (Li and Su, 2007). Singaporeans' good-provider norms are activated only when guests are expected, so ultimately they do not influence households' daily intentions to reduce food waste nor the impact of moral norms on food waste intentions. In addition, in long-term-oriented Singapore, the incentive to be thrifty and 'save for a rainy day' helps strengthen the relationship between moral obligations and intention to reduce food waste in daily life.

The difference in findings between Australia and Singapore may also support the concept of primary/secondary ethical concerns. According to Carrington, Neville and Whitwell (2014), primary ethical issues constantly affect daily choices, becoming habitually aligned with consumption behaviour. Secondary ethical concerns are not actively planned or habitually developed, and are thus unlikely to be consistently followed through to consumption behaviour. Our findings suggest that for Australians, being good to family is the primary ethical concern and prioritized in food consumption and disposal behaviour, while food waste may be the secondary ethical concern and could easily be a trade-off. Yet in Singapore, moral norms about food waste seem to be a primary concern and thus constantly influence consumers' intention and behaviour toward food waste. In this case, even individuals with strong good-provider norms will attempt to reduce food waste, eliminating

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the moderating role of the good provider on the relationship between moral norms and intentions to reduce food waste.

5.1. Theoretical Implications

Our study on food waste adds to the shifting of ethical and sustainable consumer research away from the contextual lens of purchasing (Lim, 2017) and toward alternative consumption spaces that 'both reduce and rebalance consumption more responsibly, and challenge throughputs of excess consumption and waste' (Carrigan, 2017, p. 14). In addition, this study contributes to a 'better understanding of what motivates consumers to engage in sustainable consumption within each culture which can help advertisers of sustainable companies and products create and develop more efficient advertising campaigns' (Minton et al., 2018, p. 406).

We contribute to the ethical and sustainable consumption literature in a cross-cultural context in three ways. First, to our knowledge, no other study has tested the mechanism by which moral norms are activated and influence food waste behaviour.

Second, we theoretically contributed and empirically tested the inclusion of a new construct – the good-provider norm, which deactivates moral norms – thus augmenting the NAM. This interaction between moral and good-provider norms sheds light on how consumers cope with conflicting norms when making ethical decisions.

Third, our study answers the call by Porpino (2016) and Aschemann-Witzel et al. (2018) for more cross-cultural studies to understand food waste behaviours. Our results reveal that cultural differences trigger different norm activations and interactions. Such a cross-country comparison overcomes the geographic fragmentation of sustainable consumption research and sheds light on cross-cultural differences in food waste behaviours.

5.2. Practical and Policy Implications

A better understanding of how culture affects consumer ethical and sustainable behaviours, from acquisition to disposition, is important to the design of effective marketing strategies (Swaidan, 2012); therefore, our findings suggest that food waste minimization campaigns must be culturally relevant. In Singapore, a collectivist society with external LOC, important social groups may positively influence individuals' likelihood of reducing household food waste (Kalamas et al., 2014). For example, powerful 'others', such as popular supermarkets, food delivery and catering firms, could strengthen moral norms by encouraging consumers to take home excess food after attending dinner parties or to donate excess food to charities. In addition, to further minimize food waste coming from good-provider practices, community-based action-learning programs on how to deal with excessive food (Krumdieck et al., 2012) could be arranged at specific times of the year before special occasions that are associated with increased food waste. For behavioural change to occur in Singapore, social marketing programs could link reduced food waste with social status and face in order to counteract the notion of conspicuous waste, according to which food waste is a signal of wealth and power (Block et al. 2016)

In Australia, on the other hand, it is important to minimize the norm conflict to curb food waste from consumers, given that the good-provider norms seem to be prioritized over moral norms. Social marketing programs can promote the moral dimensions of being frugal with food and encourage people to adopt different ways of providing well for the immediate family. This may include creating awareness of the health externalities (e.g. overconsumption of calories) and environment externalities (more food waste, due to throwing away excess food, and resource depletion due to overproduction) of overprovision (Alexander and Moran, 2017; Ritchie, Reay and Higgins, 2018), as well as motivating family members to purchase less (but higher-quality) food and to use leftovers in a way that will not compromise family

members' health. Such approaches will address the issue of overprovision and its related negative impacts on environment and health. Finally, the impact of wasted food on the immediate family's future (economic and environmental impact of food waste) could also be emphasized.

Given the positive impact of moral norms on households' intention to reduce food waste in cultures as diverse as Singapore and Australia, it is recommended that policy makers instil the ethical dimensions of throwing away food into their public education initiatives. For instance, messages could emphasize caring for others (e.g. 'creating a brighter food future for our children') or highlight the consequences of food waste for society (e.g. 'throwing away food is a waste of money, energy and water – stop the waste'). Thus, messages could be linked to UN Sustainability goals such as tackling food insecurity and global poverty (United Nations, 2018), and policy makers are advised to remind consumers that food waste has serious environmental consequences, including resource waste and increased greenhouse gas emissions along the whole supply chain (World Resources Institute, 2013). Public campaigns that stress consumer decision-making power and seek to reaffirm a sense of personal responsibility for wise use of the world's resources would be worthwhile. In addition, since good-provider norms and 'face' prevail in many cultures and may override the moral norms on some occasions, messages encouraging consumers to be more mindful of how these factors drive waste behaviours may help them to think more deeply about their food-related habits and practices.

Governments could also push supply chain members to help build up their institutional infrastructure. For example, the 'edible until' label could be introduced to support consumers in making food-related decisions that are less complex (Gruber et al., 2016). These labelling efforts are more effective when supported by consumer education programs to ensure that labelling is clear and understood (Block et al. 2016). Manufacturers could also support

consumers in reducing household food waste by employing new technologies to upgrade processes, products and packages. For example, new production processes or packaging can be developed and applied to keep food fresh for longer without any unhealthy additives. 'Smart' packaging and 'smart' fridges that allow households to better monitor and plan their food consumption practices can also be developed and promoted to reduce food waste. These initiatives could work well with the good-provider norms, because consumers will be aware that the product is still safe to consume and will not compromise the health of those that 'good providers' care for. Our findings strongly support the notion that future initiatives and policies need to be integrative, multi-faceted and more sensitive to underlying norms.

5.3. Limitations and Future Research

In terms of limitations, we used Hofstede's pre-measured culture scores as a framework to discuss the differences between Australia and Singapore, assuming the country as the cultural boundary. Although this is a common practice in cross-cultural research, we suggest that future research could include more regional ethnicities and sub-cultures to investigate sustainable consumption and food waste behaviours. Similarly, future research could examine differences between developed and developing countries.

This study focused on the main components of the NAM, but other constructs (e.g. cooking skills) can also directly affect food waste intentions or induce moral norms. Potential activators of moral norms include altruistic values (Stern, 2000), self-concept, self-identity, and social identity. Future studies could also test other constructs that may deactivate moral norms (such as conflicting norms and roles) and explain food waste decisions. Additionally, good-provider norms may lead not only to more food waste, but also overconsumption of calories, which is an important sustainability issue, since it adds substantially to resource pressures (Alexander and Moran, 2017; Ritchie, 2018). Future studies could explore whether

this behaviour is guided by 'self-oriented' motives such as food-related lifestyles or an emotional attachment to food, as well as 'other-oriented' motives such as the need to provide for one's family and relieve guilt about food waste. Finally, it would be interesting to investigate the application of our model in the 'away-from-home' food waste that occurs in restaurants and other food outlets, since this is the sector with the second-highest food waste percentage after households (UNEP 2021). This could shed light on the impact of good-provider and moral norms on food waste decisions when people dine out, and may also provide practical insights for food outlet managers to minimize food waste in their sector.

6. Conclusion

Understanding the moral dimensions of food waste behaviour is important to move society toward more ethical consumption practices. This study contributes to ethical consumption theory by incorporating good-provider norms into the NAM to explain how moral norms are activated and deactivated. Because culture influences ethical decision-making, we applied the augmented NAM to investigate food waste decisions in two distinct countries. The addition of good-provider norms constitutes a significant contribution to explaining the relationship between moral norms and food waste intention, which operates differently in Australia and Singapore. These findings open avenues for more targeted interventions for social marketers, manufacturers and policy makers. For an effective solution to the food waste problem, future research could build on this study by applying the augmented model in other cultural contexts and by exploring the ethical reasoning process in greater detail.