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Antecedents and Consequents of Food Waste Reduction: Do Religious Commitment and Awareness of Consequences Moderate

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Abstract:
This study empirically test the applicability of theory of planned behavior with additional variables of concern for food waste, religious commitment and awareness of consequences towards consumers food waste reduction intentions and afterward leftover foods' reuse and donate behavior. A sample of 533 respondents were selected mainly from Punjab Pakistan. Data for this study is collected from young Pakistani household consumers. The study employed structure equation modeling (SEM) to test the hypothesized model. The results of the study showed that moral norms, subjective norms, perceived behavioral control and food waste concerns may restricts consumers to avoid food wastage and promote waste reduction intentions. Furthermore the constructs of religious commitment and awareness of consequences by creating their moderating affect further strengthen this relationships. The results of the study establish that there is need to include favorable perception about benefits, cost, threat and risk associated with food waste in educational programs and advertising strategies. The inclusion of favorable perceptions becomes more effective specifically in case of socially proscribed behaviors that is food waste behaviors.

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1. Introduction

The term “waste” is generally associated with any hazardous and non-hazardous stuff that has no more use and subject to reuse, recycle or dispose of. Municipal solid waste (MSW) refers to recyclable materials and non-recyclable materials and waste from homes, institutions, businesses, and construction sites. An excessive amount of MSW waste generated by residential and commercial activities has become a significant threat to modern society, especially in big cities, causing environmental issues such as air pollution, water contamination, and greenhouse gas emissions. Food and plastic waste are a growing concern within the municipal waste, affecting the ecosystem badly. If this phenomenon is not addressed adequately, it will have devastating effects on humans and wildlife (Elagroudy et al., 2016).

Food waste is a severe problem with many environmental, ethical, and economic consequences. Because of its size, complexity, and significance, food waste has received growing attention over the past decade, both economically and socially. It represents a very relevant issue, which leads to negative economic consequences. First, it's a moral issue as 870 million people worldwide suffer from chronic malnutrition, Food and Agriculture Organization FAO (2019). Therefore, reducing food waste can be used to reduce the global hunger problem. Second, from the environmental point of view, it is evident that many resources are used to produce unwanted food. Actions taken to cater the growing demand for food must address the ongoing climate change (Kosseva, M., & Webb, C. (2013). The importance is given to the maximum amount of fertilizers and limited resources (e.g., water, soil, and human energy) used in food production, which plays a vital role in climate change FAO (2013). Too many greenhouse gases are produced in the production of these waste products that can be minimized or avoided (Tonini et al., 2018).

Humanity is facing a significant challenge in the 21st century in deciding how best to feed the people on a crowded and warmer planet. It is expected that the world's population keeps increasing in the future, and global food security will be in place in the coming years by 2050, which, combined with current food waste, will lead to an unsustainable and unethical world feeding system. That means higher restrictions will be placed on available food. Reducing food waste is considered a strategy to increase food supply to feed the world's growing population (Godfray et al., 2010). The United Nations promotes it within its goals of sustainable development. Especially, goal 12.3 states that "By 2030, reduce the per capita world's food waste at the retail and consumer levels to its half and minimize post-harvest food losses during production and supply chain". On a worldwide scale, 14% of food produced for consumption is converted to waste or lost. That value is approximately 1.3 billion tons a yaer FAO year (2019). From this quantity, 20 to 21 percent of food was lost in Central and South Asia. Pakistan accounts for 2.7%, equivalent to 36 million tons of total food waste (Dawn, 2018). The estimated 36 million tons of food wasted annually in Pakistan is almost equal to citizens of Lahore, Karachi and Hyderabad every day throwing out their lunches and dinners. According to World Food Program (WFP) country director Lola Castro, 43% of Pakistan's population remain food insecure, with 18% facing severe shortages. Pakistan is ranked as the country with worst levels of hunger by The Global Hunger Index 2016. The Global Hunger Index in 2020 ranks Pakistan 88 in 107 countries with 24.6 points and suffers from a severe level of hunger. (Nation, 2020)

Pakistan is also at high risk of climate change and will observe a reduction of 50% in crop yield by 2030. The German Watch's Global Climate Risk Index ranked Pakistan fifth on the list of countries most vulnerable to climate change in its 2020 annual report. However, despite

this sware situation in Pakistan, the issue of food waste has not been adequately considered. This is reflected in the fact that no concrete research has been done so far at the provincial or federal level to measure the amount of wasted food, restaurants and household levels to develop any policy recommendations (Aamir et al., 2018). Compared with the body of literature that aims to measure food waste and its effects, research on consumer behaviour regarding food waste is scarce. Since waste minimization is seen as one of the most effective ways to cater to food shortage and consumption level has the highest potential for waste reduction, such research is highly relevant. The current study explores that how various factors affect the consumers' food waste reduction intentions and behavior. Especially the moderating role of religious commitment and consequences of awareness towards these factors and waste reduction intentions.

2. Literature Review

According to FAO (2015), 'food waste' refers to consumable portions of plants and animals that are produced or harvested for human consumption, but ultimately are not eaten by humans and end up discarded. The type of research listed above represents an important first step in identifying some of the factors that contribute to the reduction of household waste. However, it has been argued that such an investigation should be based on some concrete theory, as theory could provide a framework for where causal mechanisms can be identified and can lead the development of effective and repetitive interventions (S. Michie et al., 2005; Susan Michie et al., 2008; Steg and Vlek, 2009). It is difficult task to apply the most appropriate theory as there are number of theories to choose from, as well as there are overlapping constructs used in different theories (S. Michie et al., 2005). Two major players are the Reasoned Action theory and its extension, the Theory of Planned Behaviour. In particular, in consumer behavior research, Theory of Planned Behaviour has been used extensively when investigating consumer behavior in various contexts, especially food waste behavior (Stefan et al., 2013; van der Werf et al., 2019; Visschers et al., 2016). However, the adequacy of the TPB model has been extensively discussed (Conner & Armitage, 1998) and it has been advocated that predictions of intentions can be amplified by the inclusion of other predictive variables. Although there are numerous additional predictors that have proven record to contribute to the use of TPB predictors in relation to household food waste reduction, these variables may not have been applied to the food waste context, or have limited evidence. Therefore, for parsimony reason the inclusion of following four additional constructs have been decided: (1) Moral Norms; (2) Food waste concern; (3) Religious commitment (4) Consequences awareness. These predictors were selected as they have been widely investigated and a have strong evidence-base across several behavioral domains, including environmental-research.

2.1 Moral Norms

The idea that 'to know the good is to do the good' has been discussed by early philosophers such as Socrates and Plato. Numerous studies thereafter agreed, and Kohlberg (1969) suggests that morality is primarily reason for individuals experience about certain actions whether they are right or wrong. Moral norms are seen as individual concern of a person about moral obligations. The ethical and socially responsible feelings of an individual are considered as moral obligations. The concept of moral norm is almost similar to the personal norms in Altruistic behavior model. These moral beliefs are about the right and wrong beliefs of a person about morality (Ajzen, 1991; Botetzagias et al., 2015). The aspect of moral attitude also appear to affect food waste because food waste makes consumers feel guilty (Evans, 2011; Yuan et al., 2016). In some studies, the inclusion of moral aspect as behavioral predictor has significantly improved predictability of intentions such as Bortoleto et al. (

2012). In a meta-analysis of the expanded TPB study, moral norms were found to predict, on average, an additional 4% (Conner & Armitage, 1998) and 3% (Rivis el al., 2009) of variations in intention. These researchers have applied moral norm with TPB (Wan et al., 2014; Beck and Ajzen, 1991; Lizin et al., 2017). In food waste context moral norms seems to be relevant as consumers feel bothered and guilty to some extent if food is wasted (Brook Lyndhurst, 2007; Stefan, et al., 2013). Contrary to above discussion (Stancu et al., 2016) found that moral norms had no significant impact on intention, Furthermore (Roodhuyzen et al., 2017) also suggested to include the dimension of moral aspect (i.e. feelings of guilt or ethical disapproval when food is wasted). Based on above discussion and past researches moral norms are considered the important factor when understanding the individual intention. Thus, it is considered appropriate to include moral norms within this research model, to better explain the consumer intention towards the reducing food waste.
H1: Moral norms are positively associated with waste reduction intentions.

2.2 Subjective Norms
Ajzen (1991) definition of subjective norms is the amount of external pressures that individuals perceive while considering to perform a certain action. This social pressure is due to the other people or groups who are considered to be close or important to the individual, like family, neighbors and friends. (Wan et al. 2012; Tonglet et al., 2004). The concept of subjective norms is mainly constituted on two components that works in combine: beliefs about how important people want them to act (normative beliefs) and negative & positive judgment about acting in accordance to these normative beliefs (motivation to comply) (Ajzen, 2005). Numerous researches used subjective norms to study the human behavior (Vining and Ebreo, 1992; Mayhew et al., 2009). Contrary to context of sustainable behavior and consumption, previous studies have taken subjective norms as important antecedents of intentions in purchase intentions and green product consumptions (Ding et al., 2018; Yadav and Pathak, 2017), energy saving intentions (Gao et al., 2017) and waste reduction and recycling intentions (Li et al., 2018b; Lizin et al., 2017). Researches reported above explained a positive relationship among SN and intentions. In the context of recycling few researches showed that there is no significant impact of subjective norms on return intentions (Jena and Sarmah, 2015; Tonglet et al., 2004). However in waste management context (Aktas et al., 2018) showed that SN positively affect the intention to reduce food waste. On the basis of previous researches subjective norms are considered as an important antecedents while explaining the human behavior.
H2: Subjective norms have a positive impact on waste reduction intentions.

2.3 Perceived Behavioural Control
The additional variable of perceived behavioral control (PBC) is developed by Ajzen (1991) to explain behavior that is sometimes beyond the control sphere of individuals. PBC is considered as the level of control a person having over his/her action. The significance of PBC as antecedents of TPB becomes very useful as it fits clearly into barriers to action whether those actions are perceived or real. The variable of PBC independently becomes the predictor of behavior in some situations where the issue of self-control are so prominent (Armitage & Conner, 2001). Till date numerous studies have highlighted the vital role of PBC towards intentions and behavior, like public behavior towards the improvement of air quality (Fu et al., 2019), recycling of e-waste (Wang et al., 2019a), and intentions towards energy-saving (Ru et al., 2018). Number of studies explained PBC as main antecedent of recycling behavior (Chu and Chiu 2003; Wang et al. 2016), however some studies reported that perceived behavioral control don't have significant impact on behavioral intention (Oztekin et al. 2017; Ma et al. 2018).

H3: Perceived behavioral control has a positive impact on waste reduction intentions.

2.4 Concerns about food waste

The Theory of planned behavior proved to be flexible and easily adaptable to analyze the additional constructs that are not part of the original TPB model (Collins and Mullan, 2011). In food waste context (Stefan et al., 2013) added the constructs of habits and routines related to the daily food choice in their study. They segregated consumers' food waste attitudes in two groups of variables, termed as concern oriented aspect and into moral aspect.

Consumers who are aware of the negative impacts of food waste will try to engage in better food management activities to minimize the quantity of food waste. Moreover, awareness of dumping edible food mainly feel people to be guilty towards waste, regret of paying extra money, and worries about adverse social and environmental impacts (Neff et al., 2015;Qi & Roe, 2016). However, study conducted by (Diaz-Ruiz et al., 2018) reveal that food waste concern of individuals can be a significant predictor of food waste behavior. Some recently conducted studies revealed that a better awareness concerning about food waste can be positively associated to a different purchase behavior as well (Mondéjar-Jiménez et al., 2016). Roodhuyzen et al. (2017) also recommended the research on food waste concerns (e.g. perception food waste as a problem, worries about its environmental or social impacts). Hence, an attitudinal factor, such as the concern for food waste, has been identified as influential variable toward food waste reduction.
H4: Concern about food waste is positively associated with intentions not to waste food.

2.5 Behavioural Intention

Behavioural decision-making, theories like Theory of Planned Behaviour (Ajzen, 1991), the Theory of Interpersonal Behaviour (Triandis, 1977), and the Theory of Reasoned Action (Aten et al., 2011; Fishbein, 1979) focuses the critical contribution of intentions as the utmost immediate and significant antecedent of individuals' behaviour. In both TRA and TPB the role of the construct of intention is undeniably central. A meta-analysis on intention conducted by Klöckner (2013) studied different common theories especially in the field of environmental psychology and proved that behavior is strongly predicted by intentions. Furthermore, researches conducted by Don Fang and Zhang (2019), and Li et al. (2018b) reported intention being most important as mediator of TPB to predicting actual behavior.

Garg and Joshi, (2018) in their study found intentions plays a significant role towards consumer behavior to not waste food and individuals who have a strong intention towards reducing the food waste also reflect a stronger behavior. Leftovers are considered as the main source of discarding food, as their reuse requires lot of efforts and flexibility in menu planning (Silvennoinen et al., 2014; Williams et al., 2012). The donation and reuse of leftovers are considered as the most important predictor of food waste reduction in prior studies (Stancu et al., 2016; Stefan et al., 2013). A further assessment of the connection among waste reduction intentions, and waste reduction behavior (reuse and donate) is required, so the following hypotheses are proposed:
H5: Food waste reduction intentions are positively associated with food leftover reuse.
H6: Food waste reduction intentions are positively associated with food leftover donation.

2.6 Religious Commitment

Religion holds an essential role in human being life. There are two dimensions of religiosity, the inter- and the intra-personal, which plays a significant role in lives of individuals' (Mokhlis & Spartks, 2007). The religious identity, attitude, values and beliefs are the part of

internal dimension of religiosity (King & Williamson, 2005), whereas religious affiliations, devotions and religious communities memberships are the part of the external dimension. The internal dimension of religiosity in the form of religious commitment was considered in this study. Individuals having commitment to their religion are more associated to their religious values, beliefs and exercise them by integrating into their daily life affaires (Aten et al., 2011). Within the all religious cultures, intentions towards reducing food waste are depended mainly on individual's level of religiosity. Several past researches have produced a significant impact of religious commitment on consumers' attitude and behaviour (Charseatd, 2016; Garg & Joshi, 2018). Garg and Joshi, (2018) identified religious commitment as driver of attitude towards halal brands.

Recently (Iranmanesh et al., 2019) test the moderating role of religious commitment on subjective norms and perceived behavioual control towards willingness to pay for halal food. Notably, the results reveal that the religious commitment moderates the relationship between PBC and willingness to pay for halal certified foods. This finding indicates that willingness to pay is higher among Muslim consumers with high religious commitment than among those with less religious commitment. As recommended by (Porpino, 2016; Roodhuyzen et al., 2017) in their future research direction from religious point of view i.e. consumers who are more religious less wasteful? Do more religious people experience more concern/guilt when food is wasted? And on the basis of the findings (Iranmanesh et al., 2019) it can be assumed that in the scenario of food waste reduction, individuals who are highly committed to their religion are expected to have a higher intentions for food waste reduction. Thus, it is expected that the existence of stronger religious commitment enhances the positive effects on consumer's intentions towards food waste reduction. Hence, on the basis of above discussion the following hypotheses are proposed:
H7: Religious commitments significantly moderate the effects of (a) moral norms, (b) subjective norms, (c) perceived behavioral control and (d) concern for food waste on waste reduction intentions.

2.7 Awareness of Consequences:
The theory of planned behavior proved to be flexible and easily adaptable to analyze the additional constructs that are not part of the original TPB model to better predict and understand the human behavior (Ajzen 1991). The awareness of consequences (AC) is the main construct of the model of altruistic behavior (Schwartz 1977) and has been adopted from there, as it create the awareness to individuals for all the possible outcomes that can be arise due to the adoption of their particular behavior. The AC becomes essential to research the human behavior while studying the individual's intention it is crucial to consider the consequences that are created as result of carrying out a specific behavior. If an individual assume that the result of engaging in a particular behavior will be positive it is obvious that he/she will display a positive attitude about that and will try to remain engage into it (Corsini et al., 2018).

Tonglet et al. (2004) suggested the inclusion of awareness of consequences as the constructs of TPB. Kochan et al., (2016) revealed that individual having the higher AC, they have a stronger intentions to engage with waste reduction and recycling behavior. Several studies showed the positive relationship of awareness of consequences on return intention (Gonul Kochan et al., 2016; Wang et al., 2016). However, Tonglet, Phillips and Read, (2004) displayed inverse relationship among awareness of consequences and intention. A number of studies have used awareness of consequences to study recycling and waste reduction behavior (Park

and Ha 2014; Wang et al. 2016). Based on the previous researches awareness of consequence are considered as important variable for this study to better understand the consumers' waste reduction behavior. In view of the current lack of research and contradictions on the role of awareness of consequences on attitudes towards food waste reduction, our hypothesis is as follows:

H8: Awareness of consequences significantly moderates the effects of waste reduction intentions towards (a) food reuse and (b) food donate.

Based on the literature presented above and by following the future research dimensions of eminent research scholars the following research framework is proposed.

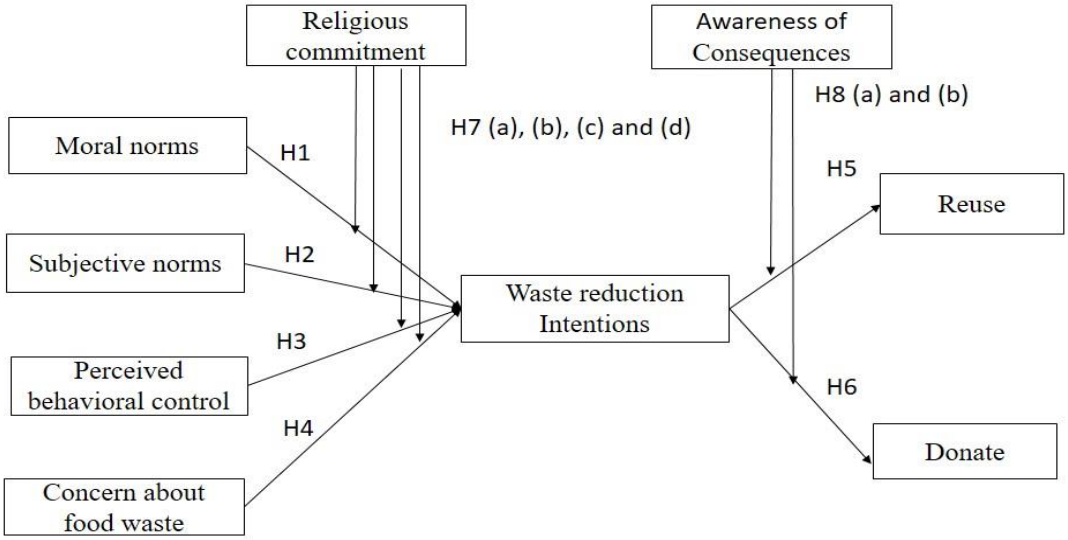

Figure 1: Conceptual framework

3. Research Methodology:

It is a cross-sectional study as data is collected from sample only once. Young Pakistani households are the target population for this study. The data is collected through online questionnaire by using the online service of survey interface of Google forms. The data is collected by using convenient sampling technique (Millar & Dillman, 2011; Prakash et al., 2019). The sample size of this study is calculated by using the formula of (Millar & Dillman, 2011) for general public. (Millar & Dillman, 2011) formula suggested that optimal sample size asses the human dimensions studies is 400 with 95% confidence of interval and with a ±5% margin of error. On a safer side the sample size for this study is 533 considered suitable.

3.1 Instruments and measures:

Based upon previous researches regarding consumer household food waste reduction, the measurement items in this study were adapted to assess how consumers' moral norms, subjective norms, perceived behavioral control, food waste concern, religious commitment and awareness of consequences affect consumer behavior towards reducing food waste. Three items pertaining to subjective norms were adapted from (Ahmad et al., 2020). The construct of moral norms is measured by four items adapted from (Olsen et al., 2010). To

measure the construct of perceived behavioral control three items were adapted from (Aktas et al., 2018). While food waste concerns were measured on the basis of three items adapted from (Stefan et al. 2013). The construct of awareness of consequences is measured by four items adapted from (Khan et al., 2019). To measure the construct of religious commitment five items are taken from the work of (Iranmanesh et al., 2018). Finally the construct of waste reduction intentions was measured by three items adapted from (Janssens et al., 2019). Finally, food reuse and donate behavior was measured with four items pertaining to leftover reuse behavior were adapted from (Domina Koch 1999). The measurement items of leftover donate behavior were adapted from (Khan et al., 2019).

3.2 Statistical Approach:

The data is analyzed by using a series of data analysis tools. Frequency analysis and descriptive statistics is used for the overview of respondents and their responses. Correlation analysis is used to examine the association among variables. Covariance based two-step structural equation modeling is used to examine measurement and structural model. Measurement model is developed to establish the confirmatory factor analysis for validity and reliability concerns. Structural model is used for testing hypotheses. Moderation analysis is perform by using PROCESS 2.13 macro for IBM SPSS (Hayes & Scharkow, 2013). In this Study SPSS 23 and AMOS 20 software is used for data Analysis.

Results and Discussions

Table 1 Demographic of Respondents

Demographic Information	Category	Frequency	Percentage
Gender	Male	284	53.3
	Female	249	46.7
Education	High School	153	28.7
	Senior High School	137	25.7
	Bachlors's degree	138	25.9
	Master's degree	105	19.7
Marital Status	Single	372	69.8
	Married	161	30.2
Family Monthly Income	US$ 200	172	32.3
	US$ 201–400	134	25.1
	US$ 401–600	90	16.9
	US$ 601–800	78	14.6
	US$ 801 and above	59	11.1
Occupation	Students	245	45.9
	Job Holder	163	30.6
	Business Persons	57	10.7
	Households	68	12.8

Source: Field study

The characteristics of respondents are illustrated in demographics Table 1. A total 533 responses were collected from young household consumers. Sample descriptive showed that 284 (53.3%) respondents were males and 249 (46.7%) respondents were females. In Education category most of the respondents 153 (28.7%) having high school qualification and 137 (25.7%) were in senior high school category. Furthermore in education category 138 (25.9%) and 105(19.7%) respondents were in bachelors and masters group respectively. On the basis of monthly family income 172 (32.2%) respondents were in less than US$ 200 monthly income category, 134 (25.1%) respondents were from (US$ 201-400) monthly income group, 90 (16.9%) respondents were from (US$ 401-600) monthly income group, 78

(14.6 %) respondents were from (US$ 601-800) group, 59 (11.1%) respondents were from above US$ 801 monthly income group.

Table 2: Validity and Reliability

Constructs	Items	Standardized factor loadings (SFLs)	Cronbach alpha (α)	Composite reliability (CR)	Average variance extracted(AVE)
Subjective Norm (SN)	SN1	0.944	0.869	0.920	0.795
	SN2	0.762			
	SN3	0.955			
Perceived Behavior Control (PBC)	PBC1	0.791	0.83	0.871	0.693
	PBC2	0.902			
	PBC3	0.799			
Concern for food Waste (CFW)	CFW1	0.764	0.763	0.799	0.570
	CFW2	0.707			
	CFW3	0.791			
Waste Reduction Intentions (WRI)	WRI1	0.724	0.762	0.796	0.566
	WRI2	0.791			
	WRI3	0.741			
Moral Norms (MN)	MN1	0.899	0.944	0.944	0.810
	MN2	0.91			
	MN3	0.91			
	MN4	0.88			
Reuse (RU)	RU1	0.817	0.855	0.856	0.599
	RU2	0.766			
	RU3	0.758			
	RU4	0.752			
Donate (DON)	DON1	0.754	0.855	0.870	0.572
	DON2	0.736			
	DON3	0.734			
	DON4	0.744			
	DON5	0.81			
Awareness of Consequences (AOC)	AOC1	0.882	0.851	0.900	0.643
	AOC2	0.874			
	AOC3	0.763			
	AOC4	0.753			
Religious Commitment (RC)	RC1	0.854	0.792	0.891	0.673
	RC2	0.781			
	RC3	0.767			
	RC4	0.875			
	RC5	0.724			

Source: software output

Table 3: Discriminant Validity

Constructs	MN	PBC	CFW	WRI	SN	RU	DON	RC	AOC
MN	**0.891**								
PBC	0.273	**0.832**							
CFW	0.184	0.092	**0.755**						
WRI	0.339	0.328	0.336	**0.753**					
SN	0.239	0.362	0.036	0.361	**0.900**				
RU	0.176	0.018	0.119	0.156	0.116	**0.774**			
DON	0.186	0.198	0.734	0.241	0.109	0.089	**0.756**		
RC	0.112	0.008	0.101	0.010	0.024	0.413	0.107	**0.802**	
AOC	0.103	0.134	0.106	0.017	0.069	0.537	0.106	0.313	**0.820**

Source: *software output*

Note: *MN= Moral Norms; PBC=Perceived Behavior Control; FWC=Food Waste Concern; WRI= Waste Reduction Intentions; SN=Subjective Norms; RU=Reuse; DON=Donate; RC= Religious Commitment; CAW=Consequences Awareness; Bold values in diagonals are square root of AVE*

Measurement Model

The study employed Structural equation modeling for the assessment of validity and structural paths of the given measurement model and structural model respectively. The results of measurement model are illustrated in Table 2 and Table 3. The measurement model is evaluated on the bases of factor loads, composite reliability, Cronbach's alpha and average variance explained (AVE) to verify the reliability and validity of constructs. The value of Cronbach's alpha of all variables is more than the threshold value of 0.70 (Nunnally, 1970) and the results of Composite reliability also more than the threshold value of 0.70 (Chung, Song, & Lee, 2017) thus establishing the reliability of data.

The average variance extracted AVE is computed to verify the convergent validity of the data The value of AVE for all study variables is more than the threshold value of 0.50 (Hair et al., 2013). The value of Factor Loads (FL) for all items is more than the 0.50 (Hair et al., 2013) which shows that no item is dropped in the study. Results obtained were in support of internal consistency reliability, convergent validity, and discriminant validity and within the prescribed range of (Fornell & Larcker, 1981). Moreover, the results shown in the Fornell-Larcker Table 3 verified the discriminant validity of the variables as the square root values of the AVE for each study variable are greater than the correlation coefficient of that variable with other variables (Hair et al., 2013). Furthermore the results obtained to evaluate the fitness of model were satisfactory as the goodness-of-fit indices showed the values of model fit indices are CMIN=1266.806, DF=491, $\chi 2/df$= 2.58; CFI= 0.925; RMSEA = 0.054, GFI= 0.884; AGFI=0.859, PGFI = 0.729, NFI = 0.963; RMR=0.1(Hu & Bentler, 1999).

Structural Model:

The structural model was employed to test the research hypothesis (H1– H6). The results of Hypotheses testing are depicted in Table 4 which supported all the given assertions. The model fit indices values are CMIN= 733.798, DF= 263 , $\chi 2/df$= 2.79 ; CFI= 0.936; RMSEA = 0.058, GFI= 0.901; AGFI=0.878, PGFI = 0.729, NFI = 0.904; RMR=0.104 The Results illustrate that MN showed a significant and positive impact on WRI (β = .250, *p< .01*), which supported H1. The Results illustrate that SN showed a significant and positive impact on WRI (β = .185, *p< .01*), which supported H2. The Results illustrate that PCB showed a significant and positive impact on WRI (β = .163, *p< .01*), which supported H3. The Results illustrate that FWC showed a significant and positive impact on WRI (β = .360, *p< .01*), which supported H4. The Results illustrate that WRI showed a significant and positive impact on RU (β = .182, *p< .01*), which supported H5. The Results illustrate that WRI showed a significant and positive impact on DON (β = .163, *p< .01*), which supported H6.

Table 4: Results of Direct Hypotheses

Hypotheses	Path	Estimates	S.E	T statistics	Results
Hypothesis (H1)	WRI <--- MN	$_{\beta}$ =0.25***	0.031	4.937	Supported
Hypothesis (H2)	WRI <--- SN	$_{\beta}$ =0.185**	0.03	3.797	Supported
Hypothesis (H3)	WRI <--- PBC	$_{\beta}$ =0.163**	0.036	3.104	Supported
Hypothesis (H4)	WRI <--- CFW	$_{\beta}$ =0.36***	0.057	6.396	Supported
Hypothesis (H5)	RU <--- WRI	$_{\beta}$ =0.382***	0.079	4.835	Supported
Hypothesis (H6)	DON <--- WRI	$_{\beta}$ =0.336***	0.079	6.13	Supported

Source: *software output*

Note: *MN= Moral Norms; PBC=Perceived Behavior Control; FWC=Food Waste Concern; WRI= Waste Reduction Intentions; SN=Subjective Norms; *** p <0.001, ** p <0.01*

Table 5: Results of moderating effects (Regression Results)

Paths	Path coefficients	*t*-statistics	Relationships
Hypothesis(H7a) **(MN×RC→WRI)**	β =.260***	6.203	Supported
Hypothesis(H7b) **(SN×RC→WRI)**	β =.262**	6.267	Supported
Hypothesis(H7c) **(PCB×RC→WRI)**	β =.188***	4.405	Supported
Hypothesis(H7d) **(CFW×RC→WRI)**	β =.238***	5.48	Supported
Hypothesis(H8a) **(WRI×AOC→RU)**	β =.450***	11.613	Supported
Hypothesis(H8b) **(WRI×AOC→DON)**	β =.179***	4.184	Supported

Source: *software output*

Note: *MN= Moral Norms; PBC=Perceived Behavior Control; FWC=Food Waste Concern; WRI= Waste Reduction Intentions; SN=Subjective Norms; RC= Religious Commitment; CAW=Consequences Awareness; *** p <0.001, ** p <0.01*

The results showed that religious commitment moderate the relationship of waste reduction intention with moral norms, subjective norms, perceived behavior control and concern for food waste, so all four hypothesis H7a, H7b, H7c and H7d are supported and accepted. As for as the relationship of waste reduction intention with food reuse and donate is concern is it moderated by awareness of consequences the results show that awareness of consequences moderate these relationships. On the basis of results presented in table-5 both the hypothesis H8a and H8b are accepted.

4. Conclusions and Implications

The results of the study showed that moral norms, subjective norms, perceived behavioral control and food waste concerns may restricts consumers to avoid food wastage and promote waste reduction intentions. Furthermore the constructs of religious commitment and awareness of consequences by creating their moderating affect further strengthen this relationships. The results of the study validate the existing research that such personal values predict behavioral intentions about food wastage and promote to reuse or donate food intentions. (Leverenz et al., 2019; Stancu et al., 2016). This study attempted to provide in depth understanding by providing empirical results about food waste reduction behavior as this research examine the last tier of supply chain of food management that is consumer also acknowledged as the major contribution of food waste. Regardless of efforts made by research scholars and practitioners for restricting food waste, household food waste at consumer level is one of the prominent issues that negatively impact society and environment.

This study attempted to address the major conceptual and methodological gaps and uncover the food waste reduction behavior of house-hold young consumers. This study provides multiple implication to practitioners based on the results of the study. First the results of the study establish that there is need to include favorable perception about benefits, cost, threat and risk in educational programs and advertising strategies. The inclusion of favorable perceptions becomes more effective specifically in case of socially proscribed behaviors that is food waste behaviors. The recognition of cost and value compromised that may arise from the unnecessary food waste that require natural as well as economical resources may develop a stronger sense of inherent wrongness and putting other into danger through individual behavior. So it would be effective tool for policy makers and practitioners to include cost and benefits in educational programs and advertising strategies to motivate consumers for food waste preventions. In order to transform behavior towards food waste consumer should educate about the positive outcomes of eliminating food wastage. The awareness about the value of economic losses, environmental damage and social issues caused by food wastage

motivate customers to avoid from food wastage. Also religious scholars should emphasis on this issue so that people relate it with religion and consider such acts as sin will prevent the food wastage. Furthermore building perceptions about threat and risk also encourage them to contribute in food waste reduction. For designing better customer appeal to transform behavior towards food waste reduction the exhibits of extreme environmental degradation is also very helpful.

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