Driving Factor of Indonesian Muslims' Intention in Household Food Waste Management: Generational Comparison

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Abstract. Food waste in Indonesia is predicted to increase if the problems are not taken seriously. The role of food waste management is essential to reduce its effects on the environment, society, and economy. Studies on the driven factor of intention to manage household food waste between generations are still limited. We address this gap by developing a research model with the Theory of Interpersonal Behavior includes economic and religiosity factors to explain food waste management behavioral intention between generations. The result shows that anticipated guilt, sense of community, awareness of consequences, environmental knowledge, financial concern, and religiosity are positively associated with managing food waste in generations Y and Z. However, this study did not find a significant relationship between financial concern and recycling intention. Further, anticipated guilt did not have an impact on the reuse intention of Generation Y, financial concern factor did not significant on the reuse intention of Generation Z, and religiosity did not show an impactful effect on reducing, reusing, and recycling intentions of Generation Z. The findings provide implications for developing strategies to encourage food waste management in Indonesia household.

Key words: Food waste management, generational comparison, household food waste, religiosity, theory of interpersonal behavior.

Abstrak. *Timbulan sampah makanan di Indonesia diprediksikan terus bertambah bila tidak diatasi dengan serius. Upaya pengelolaan sampah makanan perlu dilakukan guna mengurangi dampak negatifnya pada lingkungan, sosial, dan ekonomi. Penelitian mengenai faktor pendorong intensi melakukan upaya pengelolaan sampah makanan rumah tangga antargenerasi masih terbatas. Penelitian ini berusaha mengatasi limitasi tersebut dengan mengembangkan model penelitian menggunakan* theory of interpersonal behavior *serta aspek ekonomi dan religiositas untuk menjelaskan perilaku mengelola sampah makanan rumah tangga. Hasilnya menunjukan bahwa* anticipated guilt, sense of community, awareness of consequences, environmental knowledge, financial concern, *dan* religiosity *berpengaruh positif signifikan terhadap intensi mengelola sampah makanan pada generasi Y dan Z. Namun penelitian ini tidak menemukan hubungan yang signifikan antara* financial concern *terhadap* recycle intention *pada generasi Y dan Z. Ditemukan juga bahwa* anticipated guilt *tidak signifikan memengaruhi* reuse intention *dari generasi Y,* financial concern *tidak signifikan memengaruhi* reuse intention *dari generasi Z, dan* religiosity *tidak signifikan memengaruhi* reduce, reuse, *dan* recycle intention *dari generasi Z. Hasil penelitian ini memberikan implikasi yang signifikan untuk mengembangkan strategi yang dapat mendorong perilaku pengelolaan sampah makanan rumah tangga.*

Kata Kunci: *Pengelolaan sampah makanan, perbandingan antargenerasi, religiositas, sampah makanan rumah tangga, teori perilaku interpersonal.*

INTRODUCTION

Food waste is one of the global issues refers in Sustainable Development Goals (SDG) 20230 because the growth of food waste continues to increase. The Food and Agricultural Organization (FAO) estimates that around 1.3 billion tonnes of food produced worldwide is wasted annually (FAO, 2011; Principato et al., 2021). Food waste is an issue in developed and developing countries, including Indonesia, which is experiencing significant growth in food waste. Globally, Indonesia is the second largest contributor after Saudi Arabia, with an estimated 300 kg of food waste per individual per year

(Economist Intelligence Unit, 2016). According to The Ministry of National Development Planning (Bappenas), the amount of food waste will increase gradually until 2030 due to the growth of consumer class and urbanization that leads to the enlargement of food demand (Bappenas et al., 2021). Households, major food waste contributors in Indonesia, contribute around 40.7% of total food waste (KLHK, 2021).

Food waste contributes to significant economic, environmental, and social losses (Aktas et al., 2018; Kasri et al., 2021; Russell et al., 2017). Indonesia faced economic damage from food waste from 2000-2019, around 213-551 trillion rupiah, equivalent to 4-5% of the total national GDP (Bappenas, 2021). Concerning environmental loss, food waste indicates a waste of resources used to produce food like soil, air, fertilizer, and energy (Kasri et al., 2021; Rajeh et al., 2021; Russell et al., 2017). In addition, it leads to the development of greenhouse gas (GHG) emissions, producing about 7.29% of GHG in Indonesia per year.

Moreover, over 70% of waste ends up in landfills, which harms the health of people living near landfills due to the dangerous by-products released during the waste degradation process. Statistic Indonesia (BPS) exposed the prevalence of undernourishment (PoU) in 2021 at 8.49%, which implies many people consume an amount of food that is insufficient to provide the energy needed for life (Rizaty, 2022). The bitter truth is that despite the growth in food waste, many people do not consume enough food. Thus, food waste management (FWM) is needed to overcome the problem and its consequences (Flanagan and Priyadarshini, 2021).

Community behavior contributes to tackling the food waste problem. Each person has different behaviors based on their characteristics, such as age. Several studies show the differences in behavior between generations Y and Z regarding food waste (Bilska et al., 2020; Przezbórska-Skobiej and Wiza, 2021; Quested and Luzecka, 2014; Stancu et al., 2016). On the one hand, Attiq, Habib, et al. (2021) found that young consumers (aged 18 - 24) contribute more to food waste management behavior than older groups. On the other hand, Bilska et al. (2020) discovered that younger people throw away food more often than older people. Hence, it is interesting to explore more about different behaviors toward FWM based on age in Indonesia's scope.

Within the scope of science, efforts to do FMW have been explained through the concept of a Food Recovery Hierarchy are reduce, reuse, and recycle (3R) as the most recommended stages in describing the behavior of managing food waste (Ariyani and Ririh, 2020; Attiq, Chau, et al., 2021; Attiq, Chu, et al., 2021; Attiq, Habib, et al., 2021). The behavior of managing food waste is complex because it is difficult to predict accurately. Despite this complexity, there needs to be a method that can provide a comprehensive explanation to encourage this behavior.

A person's behavior is motivated by their intention to perform the behavior. Many factors affect a person's intention to behave in managing food waste. Experts explain besides cognitive factors, non-cognitive factors or the role of emotions and social factors can encourage food waste management behavior (Attiq, Habib, et al., 2021; Russell et al., 2017). The Theory of Interpersonal Behavior (TIB) provides an appropriate explanation because it considers the influence of cognitive and non-cognitive factors on behavior (Attiq, Habib, et al., 2021; Ibrahim et al., 2018; Martiskainen, 2007).

Several studies have also found the importance of religion and its teachings on consumption ethics and pro-environmental behavior (Nurhaida et al., 2022; Kasri et al., 2021; Rizkitysha and Hananto, 2022; Solekah et al., 2020). Islam, a religion embraced by 86.7% of the people in Indonesia, has ordered its followers to avoid wasting food, eat enough food, and share food with others. So, it is proper for Muslims to behave according to these teachings (Abdelhamid, 2021).

Currently, there is a lack of research examining the relationship between religiosity and behavioral intentions to manage food waste in Indonesia using the theory of interpersonal behavior. Therefore, this motivates us to fill the research gap by searching which factors, including religiosity, can

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influence the behavioral intention to manage food waste among Muslims in Indonesia. The findings in this study are to provide theoretical and practical implications. In theory, this study attempts to fill the research gap on the effect of religiosity on food waste management intentions and compares between generations with multigroup analysis. Practically, the research results provide knowledge that can increase the awareness of generations Y and Z through appropriate policies and campaigns to encourage the intention to manage food waste.

LITERATURE REVIEW

Based on the Food Recovery Hierarchy model, the 3R (reduce, reuse, and recycle) principles is the most recommended steps in food waste management efforts. Reduce can be interpreted as the stage of reducing and preventing food from turning into waste. Furthermore, the reuse stage includes storing and reusing food scraps and ready-to-eat food, providing food that is suitable for excessive consumption to others, and giving leftovers to animals. Recycle means turning food waste into new substances or products that have added value. According to Bappenas, the reduce and recycle stages have high potential and become a priority in the circularity of the food sector in Indonesia (Bappenas et al., 2021). Although the reuse stage is considered to have low potential, this stage is more recommended than recycling because it consumes less energy in the process (FAO, 2013).

Several studies already conduct to analyze factors influencing an individual's intention to do food waste management (FWM) behavior. The Theory of Planned Behavior (TPB) by Ajzen (1991) has been widely used to explore individuals' behaviors related to food waste. This theory suggests that various factors, such as attitudes, subjective norms, and perceived behavioral control, can influence human behavior and intentions (Principato et al., 2021). Both international (Aktas et al., 2018; Elshaer et al., 2021; Flanagan and Priyadarshini, 2021; Muniandy et al., 2021) and domestic (Amir et al., 2016; Ariyani and Ririh, 2020) studies have adopted TPB to examine the indicators driving the intention to reduce FWM behavior. The results indicate that attitudes toward behavior, subjective norms, and perceived behavioral control are significant indicators defining the drivers of intention in reducing FWM behavior.

In addition to the factors explained by TPB, other factors are considered for FWM intention, such as socioeconomic, psychological, social, situational, and demographic factors (Principato et al., 2021). Furthermore, experts also explain that studying only cognitive factors will not suffice in explaining FWM behavior. Thus, the latest research should also count social and emotional factors related to FWM behavior (Attiq, Habib, et al., 2021; Russell et al., 2017). Theory of Planned Behavior, as the most used theory, is considered unable to explain the emotional and social aspects that exist too limited in consumer behavior because it overlooks these aspects (Attiq, Chu, et al., 2021; Issock et al., 2020). Therefore, the Theory of Interpersonal Behavior (TIB), which has a more comprehensive model for explaining these aspects, is considered a suitable theoretical framework for explaining FWM behavior.

On the side of cognitive factors, the intention to engage in Food Waste Management behavior is also affected by non-cognitive factors such as emotions. Emotional aspects like anticipated guilt can influence an individual's intention to FWM behavior. Several studies have found a positive relationship between anticipated guilt and intentions to reduce, reuse, and recycle (Attiq, Chau, et al., 2021; Attiq, Chu, et al., 2021; Attiq, Habib, et al., 2021; Russell et al., 2017; Soorani and Ahmadvand, 2019). Despite the positive relationship between emotional factors and intentions to reduce food waste, Russell et al. (2017) also found a positive relationship between these factors and wasteful behavior due to different mechanisms involved in long-term intentions compared to immediate behavior.

Social factors, such as a sense of community, also play a role in influencing individuals' intentions toward FWB behavior. When individuals feel part of their society, such as their residential or workplace community, they develop a sense of belonging and responsibility toward that environment.

Attiq, Habib, et al. (2021) found a positive relationship between a sense of community and intentions to reduce and recycle food waste. Additionally, a sense of community is a substantial and significant predictor of pro-environmental behavior (Omoto and Packard, 2016).

Furthermore, individuals who understand the consequences of their actions are motivated to adopt positive attitudes toward specific behaviors to achieve favorable outcomes (Attiq, Habib, et al., 2021). Several studies have found that awareness of consequences significantly positively impacts intentions in waste management behavior in general (Filimonau et al., 2020; Issock et al., 2020; Wu et al., 2022) and intentions to reduce, reuse, and recycle food waste (Attiq, Chau, et al., 2021; Attiq, Chu, et al., 2021; Attiq, Habib, et al., 2021). Likewise, individuals with knowledge about environmental issues (environmental knowledge) also have higher intentions to reduce waste. Several studies have demonstrated a significant relationship between environmental knowledge and intentions to manage food waste (Ariyani and Ririh, 2020; Attiq, Habib, et al., 2021; Wu et al., 2022).

From an economic perspective, financial concerns are also a significant factor in food waste reduction (Attiq, Chu, et al., 2021). Left-over food and food waste represent lost economic value. Therefore, wasting food is perceived as wasting money. Attiq, Chu, et al. (2021) found that financial concerns significantly influence intentions to reduce, reuse, and recycle. Furthermore, the role of religion in guiding behavior is one of the factors influencing individuals' intentions toward FWM behavior. Several studies have examined the influence of religiosity on pro-environmental behavior in general (Bhuian et al., 2018; Bhuian and Sharma, 2017; Singh et al., 2021; Solekah et al., 2020) and reducing food waste behavior (Elshaer et al., 2021; Kasri et al., 2021; Minton et al., 2019). In a study by Minton et al. (2019), religiosity significantly influenced intentions to reduce food waste.

METHOD

Theoretical Framework
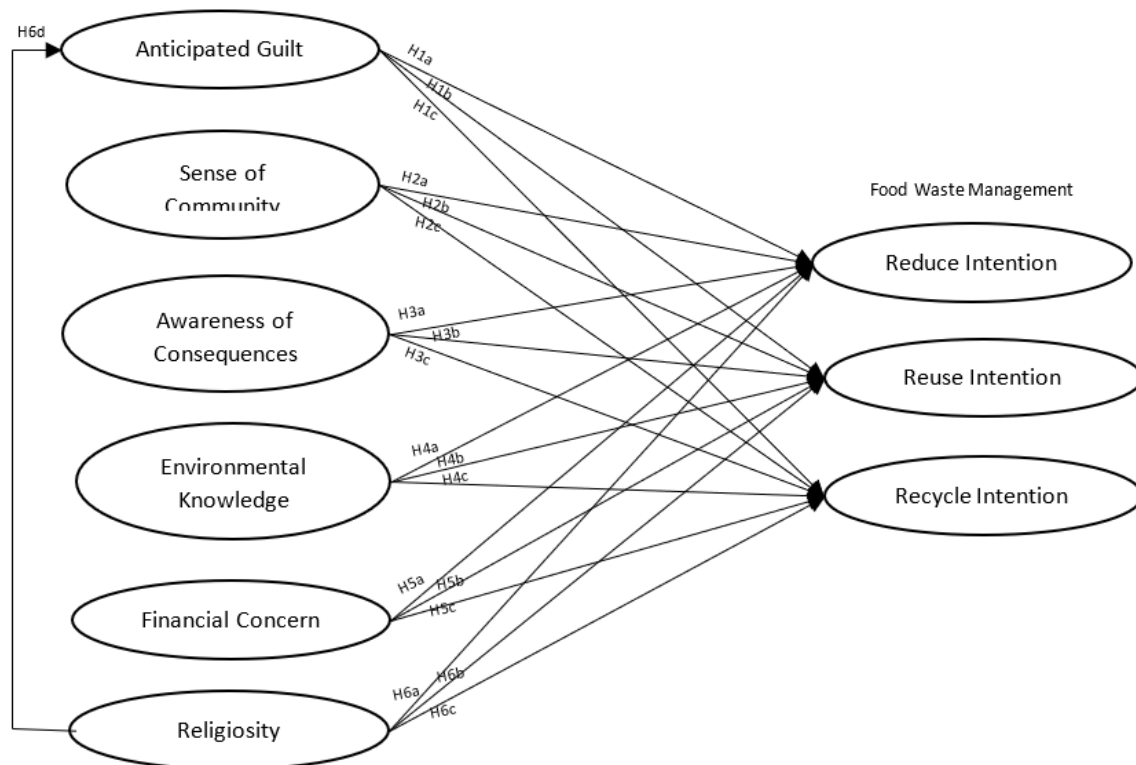
Source: Authors, 2022.

Figure 1 Research framework

Our research framework was modified from Attiq, Chu, et al. (2021) and Attiq, Habib, et al. (2021) research. We added the religious variable as a significant factor to fill the research gap. There are six independent variables such as anticipated guilt (ENG), sense of community (SOC), awareness of consequences (AOC), environmental knowledge (ENK), financial concern (FCR), and religiosity (REG) as indicators that affect food waste management behavior (3R) in Generations Y and Z as dependent indicators. Experts explain that focusing only on cognitive factors will not affect individual intention to perform FMW behavior. Current research should also count social and emotional factors associated with behavior toward food waste (Attiq, Habib, et al., 2021; Russell et al., 2017). Therefore, we use those variables that found a positive significant effect on the intention to complete FWM behavior. In addition, the role of religiosity is considered one of the motivators that increases guilt and leads to the avoidance of bad behavior (Adil, 2021; Bakar et al., 2013).

Data Collection and Sample Size

This study uses primary data using the survey method (online questionnaires) filled out independently by the respondents. Furthermore, we employ a non-probability purposive sampling technique because of the determination of the sample characteristics chosen by the researcher. This research focuses on Indonesian Muslims born between the years 1981 to 2012, divided into Generation Y and Generation Z. According to BPS, most of the population in Indonesia is from Generation Y and Generation Z, 69 million and 75 million people, respectively.

Data Estimation Method

This research uses the Partial Least Square Structural Equation Model (PLS-SEM) as a statistical model that seeks to explain the causal relationship between many simultaneous variables. This method is suitable for research that uses rarely used theory (Hair et al., 2019). Measurement and structural model analysis are employed to strengthen the analysis. This research wants to know the differences between groups based on age or generation, namely generations Y and Z. So, we conduct a multigroup analysis to reach that goal. Lastly, we perform Smart PLS 3.0 software to do statistical analysis.

Respondent Characteristic

From 935 observations, the number of respondents from Generations Y and Z is almost the same, 50.3% and 49.7% of the total observations, respectively. Most of the respondents were women (85.3%) with a senior high school education equivalent (61.5%), lived in urban areas (64.2%), and came from Jabodetabek (56.8%). The majority of Generation Y are married (46.1%) and are housewives (31%) with a monthly income of 3-5 million rupiah (18.5%). Furthermore, the majority of Generation Z are unmarried (38.6%) and are students (29.2%) with monthly income below 1.5 million rupiah (22%). Both generations spend 21 – 40% of their income (21.5%) on food consumption.

Table 1 Respondent characteristic

Demography	Y dan Z (%)	Y (%)	Z (%)
Generation			
Y	470 (50.3%)		
Z	465 (49.7%)		
Gender			
Man	137 (14.7%)	43 (4.6%)	94 (10.1%)
Woman	798 (85.3%)	427 (45.7%)	371 (39.6%)
Education			
Didn't finish	6 (0.6)	4 (0.4%)	2 (0.2%)
Elementary School	46 (4.9%)	30 (3.2%)	16 (1.7%)
Junior High School	575 (61.5%)	274 (29.3%)	301 (32.2%)
Senior High School	74 (7.9%)	46 (4.9%)	28 (3.0%)
Diploma's degree	226 (24.2%)	109 (11.7%)	117 (12.5%)
Bachelor's degree	8 (0.9%)	7 (0.7%)	1 (0.1%)
Postgraduate's degree	6 (0.6%)	4 (0.4%)	2 (0.2%)

Table 1 Respondent characteristic (continue)

Demography	Y dan Z (%)	Y (%)	Z (%)
Marital Status			
Single	393 (42%)	32 (3.4%)	361 (38.6%)
Marriage	534 (57.1%)	431 (46.1%)	103 (11%)
Divorce	8 (0.9%)	7 (0.7%)	1 (0.1%)
Death Divorce	0	0	0
Domicile			
Rural	335 (35.8%)	191 (20.4%)	144 (15.4%)
Urban	600 (64.2%)	279 (29.8%)	321 (34.3%)
Resident Island			
Jawa-Jabodetabek	531 (56.8%)	230 (24.6%)	301 (32.2%)
Jawa non-Jabodetabek	306 (32.7%)	194 (20.7%)	112 (12%)
Others	98 (10.5%)	46 (4.9%)	52 (5.6%)
Occupation			
Student	277 (29.6%)	4 (0.4%)	273 (29.2%)
Government employees	12 (1.3%)	7 (0.7%)	5 (0.5%)
Private employees	116 (12.4%)	62 (6.6%)	54 (5.8%)
Teacher/Lecturer	16 (1.7%)	9 (1%)	7 (0.7%)
Housewife	370 (39.6%)	290 (31%)	80 (8.6%)
Entrepreneur	53 (5.7%)	37 (4%)	16 (1.7%)
Self-employed	70 (7.5%)	51 (5.5%)	19 (2%)
Other	21 (2.2%)	10 (1.1%)	11 (1.2%)
Income per Month			
< 1,500,000	286 (30.6%)	80 (8.6%)	206 (22%)
1,500,001 – 3,000,000	278 (29.7%)	135 (14.4%)	143 (15.3%)
3,000,001 – 5,000,000	25 (27%)	173 (18.5%)	79 (8.4%)
5,000,001 – 10,000,000	102 (10.9%)	71 (7.6%)	31 (3.3%)
>10,000,001	17 (1.8%)	11 (1.2%)	6 (0.6%)
Consumption for Food			
0 – 20% of income	148 (15.8%)	45 (4.8%)	103 (11%)
21 – 40 % of income	378 (40.4%)	177 (18.9%)	201 (21.5%)
41 – 60% of income	280 (29.9%)	167 (17.9%)	113 (12.1%)
61 – 80% of income	105 (11.2%)	69 (7.4%)	36 (3.9%)
>80% of income	24 (2.6%)	12 (1.3%)	12 (1.3%)
Influencing Figures Preferences			
Family/Friends	304 (32.5%)	291 (31.1%)	595 (63.6%)
Key Opinion Leaders	13 (1.4%)	31 (3.3%)	44 (4.7%)
Government	45 (4.8%)	32 (3.4%)	77 (8.2%)
Public Figure/Influencer	41 (4.4%)	52 (5.6%)	93 (9.9%)
Religious Leaders	45 (4.8%)	19 (5.6%)	64 (6.8%)
Others	22 (2.4%)	40 (4.3%)	62 (6.6%)
Informational Channel Preferences			
Book	0	1 (0.1%)	1 (0.1%)
Social Media: Instagram/Facebook/Twitter/TikTok	202 (21.6%)	220 (23.5%)	422 (45.1%)
Internet	121 (12.9%)	111 (11.9%)	232 (24.8%)
Close Friend	13 (1.4%)	24 (2.6%)	37 (4%)
Televsion	20 (2.1%)	8 (0.9%)	28 (3%)
Youtube	114 (12.2%)	101 (10.8%)	215 (23%)
Radio	0	0	0

Source: Authors, 2022.

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RESULTS AND DISCUSSION

Measurement and Structural Model

Analysis of the measurement model aims to determine whether the indicator represents a targeted latent construct. Conduct by looking at the size and significance of loading indicators, reliability, convergent validity, and discriminant validity (Hair et al., 2019). The indicator is convergently valid if the loading factor value is above 0.5 and the Average Variance Extracted (AVE) value is above 0.5. Meanwhile, the variable is discriminantly valid when the Heterotrait-Monotrait Ratio of Correlations (HTMT) value must be less than 0.9. Furthermore, to check the reliability from Cronbach's Alpha (CA) value of more than 0.6 and Composite Reliability (CR) of more than 0.7.

Table 2 Measurement result

Variable	Indicators	Convergent Validity		Discriminant Validity	Reliability	
		Loading	AVE	HTMT <0.9	CA	CR
Anticipated Guilt	ANG1	0.563				
	ANG2	0.849				
	ANG3	0.826	0.606	Yes	0.883	0.883
	ANG4	0.831				
	ANG5	0.787				
Sense of Community	SOC1	0.613				
	SOC2	0.779				
	SOC3	0.838	0.603	Yes	0.866	0.900
	SOC4	0.784				
	SOC5	0.839				
	SOC6	0.785				
Awareness of Consequences	AOC1	0.760				
	AOC2	0.796	0.615	Yes	0.792	0.865
	AOC3	0.791				
	AOC4	0.790				
Environmental Knowledge	ENK1	0.827				
	ENK2	0.849				
	ENK3	0.849	0.685	Yes	0.885	0.916
	ENK4	0.824				
	ENK5	0.787				
Financial Concern	FCR1	0.682				
	FCR2	0.734	0.488	Yes	0.650	0.790
	FCR3	0.576				
	FCR4	0.783				
Religiosity	REG1	0.678				
	REG2	0.616				
	REG4	0.683				
	REG5	0.705	0.449	Yes	0.796	0.850
	REG6	0.717				
	REG7	0.671				
	REG8	0.613				
Reduce Intention	RED1	0.830				
	RED2	0.877	0.679	Yes	0.840	0.894
	RED3	0.869				
	RED4	0.708				
Reuse Intention	REU1	0.750				
	REU2	0.761				
	REU3	0.787	0.573	Yes	0.816	0.870
	REU4	0.728				
	REU5	0.759				
Recycle Intention	REC1	0.892				
	REC2	0.921	0.826	Yes	0.894	0.934
	REC3	0.913				

Source: Authors, 2022.

Table 2 shows that indicator religiosity 3 (REG3) has been removed from the model because it has a loading factor value of less than 0.5. Furthermore, the financial concern and religiosity variables have an AVE value below 0.5 but have a composite reliability value of more than 0.6. According to Fornell and Larcker (1981), the financial concern and religiosity variables are still considered convergently valid. Furthermore, all indicators and variables are discriminantly valid as they have HTMT values below 0.9. Subsequently, all variables have met the minimum criteria for reliability, indicating that all variables exhibit a high level of measurement consistency and reliability. As a result, all indicators and variables met the standard for the validity and reliability of the model.

Structural Model

Table 3 Structural collinearity

	Reduce Intention	*Reuse Intention*	*Recycle Intention*	*Anticipated Guilt*
Anticipated Guilt	1.688	1.688	1.688	
Sense of Community	1.364	1.364	1.364	
Awareness of Consequences	1.701	1.701	1.701	
Environmental Knowledge	1.376	1.376	1.376	
Financial Concern	1.246	1.246	1.246	
Religiosity	1.435	1.435	1.435	1.000

Source: Authors, 2022.

Structural model analysis aims to see the relationship and the magnitude of the influence of the latent construct. In evaluating the structural model analysis, it is necessary to ensure no multicollinearity problem in the model. Based on Table 3, all variables have VIF values of less than 5, indicating no collinearity issues in the research model.

Table 4 Coefficient determination (R^2)

Variable	R Square	R Square Adjusted
Reduce Intention	0.451	0.448
Reuse Intention	0.412	0.408
Recycle Intention	0.457	0.453
Anticipated Guilt	0.168	0.167

Source: Authors, 2022.

In addition, testing the coefficient of determination is also carried out to see the predictive power in the sample. Table 4 shows the results of the coefficient determination model. The recycle intention variable exhibits the highest R-squared value at 0.457, indicating that 45.7% of its variance can be accounted for by anticipated guilt, sense of community, awareness of consequences, environmental knowledge, financial concern, and religiosity. Additionally, the variable "anticipated guilt" is only explained by religiosity to the extent of 16.8%, with the rest attributed to variables not included in the model. Furthermore, path coefficient significant tests were also conducted. In addition, significant tests are conducted by looking at the path coefficients and p-values to know the significance and magnitude of the influence of the construct.

Figure 2 indicates out of the 19 hypotheses proposed, 18 demonstrate a significant positive association between independent variables and the intention to engage in Food Waste Management (FWM). However, only the relationship between financial concern and recycling intention is insignificant. The efforts to recycle need more money than throwing the leftover food, which is considered a barrier, and people tend to throw away their food rather than recycle (Attiq, Chu, et al., 2021).
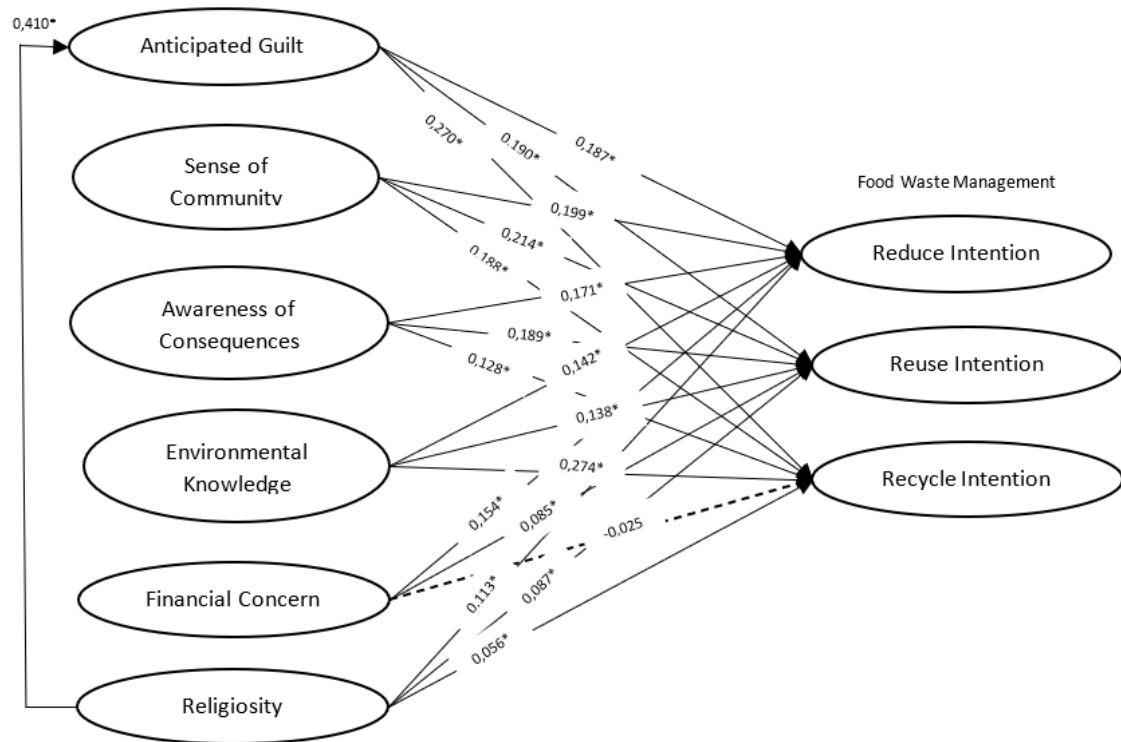
Source: Authors, 2022.

Figure 2 Significant result

Multigroup Analysis (MGA)

Table 5 MGA Result

Construcs	Path Coefficient [P-value] Generasi Y	Path Coefficient [P-value] Generasi Z
Anticipated Guilt → Reduce Intention	0.102* [0.025]	0.225* [0.00]
Anticipated Guilt → Reuse Intention	**0.074 [0.074]**	0.264* [0.000]
Anticipated Guilt → Recycle Intention	0.151* [0.002]	0.326* [0.000]
Sense of Community → Reduce Intention	0.156* [0.001]	0.195* [0.000]
Sense of Community → Reuse Intention	0.199* [0.000]	0.198* [0.000]
Sense of Community → Recycle Intention	0.209* [0.000]	0.131* [0.002]
Awareness of Consequences → Reduce Intention	0.249* [0.000]	0.134* [0.005]
Awareness of Consequences → Reuse Intention	0.186* [0.001]	0.183* [0.000]
Awareness of Consequences → Recycle Intention	0,104* [0.026]	0.117* [0.008]
Environmental Knowledge → Reduce Intention	0.108* [0.011]	0.180* [0.000]
Environmental Knowledge → Reuse Intention	0.089* [0.029]	0.189* [0.000]
Environmental Knowledge → Recycle Intention	0.229* [0.000]	0.342* [0.000]
Financial Concern → Reduce Intention	0.141* [0.000]	0.159* [0.000]
Financial Concern → Reuse Intention	0.129* [0.003]	**0.050 [0.137]**
Financial Concern → Recycle Intention	**-0.013 [0.382]**	**-0.044 [0.141]**
Religiosity → Reduce Intention	0.219* [0.000]	**0.044 [0.193]**
Religiosity → Reuse Intention	0.202* [0.000]	**-0.003 [0.471]**
Religiosity → Recycle Intention	0.204* [0.000]	**-0.041 [0.192]**
Religiosity → Anticipated Guilt	0.368* [0.000]	0.399* [0.000]

Source: Authors, 2022.

Based on the multigroup analysis, there is no difference in the effects of the anticipated guilt to reduce and recycle intention, awareness of consequences to reduce, reuse, and recycle intention, environmental knowledge to reduce, reuse, and recycle intention, financial concern to reduce intention, and sense of community to reduce, reuse, and recycle intentions in generations Y and Z. However, the results found that five constructs have different influences between generations Y and Z, namely the effect of anticipated guilt on the reuse intention of generation Y, financial concern on the reuse intention of generation Z, and religiosity on the reduce, reuse, and recycle intention of generation Z.

Discussion

The study found associations between the anticipated guilt and the food waste management (3R) intentions of Generations Y and Z. This shows that while individuals' feelings of guilt regarding food wastage increase, their intentions to manage food waste also intensify. These hypothesis test results are consistent with Attiq, Habib, et al. (2021), indicating a significant positive relationship between anticipated guilt and 3R intentions. Feelings of guilt drive individuals to act responsibly by ethics and social norms, motivating them to reduce food waste. Thus, individuals experience guilt if they fail to contribute to food waste reduction, violating their moral standards or internalized personal norms (Attiq, Habib, et al., 2021).

Furthermore, previous research conducted by Attiq, Chau, et al. (2021) found that the sense of community significantly influences the intentions to reduce and recycle food waste but not to reuse food leftovers. Nevertheless, this study found a sense of community significantly encouraged the food waste management intention (3R) among Generation Y and Z. These findings indicate that individuals who perceive themselves as part of their environment and feel a sense of community among them are more likely to have higher intentions to manage household food waste because they feel responsible and want to contribute better to the environment. Feeling a part of a community and experiencing a sense of belonging to the surrounding environment enhances their responsibility toward that environment (Attiq, Chau, et al., 2021; Yuriev et al., 2020).

It also indicates that awareness of consequences and environmental knowledge has a positive influence on food waste management (3R) intentions among Generation Y and Z. Individuals who maintain good literacy and information regarding the environment, social, and economic consequences of food waste are more likely to exhibit pro-environmental behaviors (Filimonau et al., 2020). Moreover, most Generation Y and Z in Indonesia are concerned about environmental issues, including being aware that climate change is critical and that environmental conditions will worsen in the future (Dihni, 2021). Both generations believe that managing food waste can reduce air pollution, decrease waste accumulation in landfills, and help preserve natural resources and the environment for future generations. They also consider themselves to have sufficient knowledge about environmentally friendly products, food waste management, and various environmental issues.

Based on this study, financial concern significantly affects the intentions to reduce food waste and reuse food leftovers among both generations. Food waste represents a loss of economic value and a waste of money; individuals aware of this tend to have a greater intention to manage food waste. Both generations strongly agree that wasting food is a waste of money. Therefore, this research indicates that the high awareness among both generations of the economic value lost through food waste drives their intentions to reduce food waste and reuse food leftovers.

However, this study did not find a significant relationship between financial concern and intentions to recycle food leftovers. This finding contradicts the results of the research by Attiq, Chu, et al. (2021), which found that financial concern has a significant influence on intentions to recycle food waste. This finding may be because recycling efforts like making food waste compost require high costs. That is considered a barrier for individuals to recycle food leftovers (Attiq, Chu, et al., 2021). Therefore, individuals may choose to discard food rather than recycle it because they perceive the costs incurred and the value lost to be lower.

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The teachings of religion internalized by individuals shape their attitudes and behaviors, and Islam provides clear guidance on ethical consumption and environmental stewardship, including food waste. The study indicates that the level of religiosity among Generation Y and Z drives their intentions to manage food waste because it aligns with the values and teachings of Islam. These findings are consistent with the results of research conducted by Minton et al. (2019), where religiosity directly influences food waste reduction behavior. Furthermore, the results also show that a higher level of religiosity will encourage generations Y and Z to feel more guilty when they behave in wasting food.

Based on the Multigroup analysis, we demonstrate how each variable affects differently among generations. Five constructs have differences in influence on food waste management intention between Generation Y and Generation Z. This study implies the feelings of guilt and shame of Generation Y when wasting food did not affect their intention to reuse leftovers. They prefer to reduce and recycle food waste instead. However, time constraints are also a factor, as busy generations tend to be less engaged in relevant behaviors to prevent food waste, such as not reusing leftovers. Furthermore, only 10% of Generation Y individuals bring back edible leftovers, as they feel more ashamed to store or reuse food leftovers than to waste or discard them (Kresna, 2017).

Moreover, it found Generation Z does not consider finances when discarding food waste and chooses not to reuse leftovers. Attiq, Chu, et al. (2021) mention the lack of concern among young consumers (Generation Z) regarding financial wastage when they discard food. Due to limited awareness of the economic value lost through food waste, Generation Z often opts to dispose of their food rather than storing and reusing leftovers.

Furthermore, the research results show the level of religiosity among Generation Z does not drive their intentions to manage household food waste (3R). Delener (1994) states that everyone has a different level of religiosity, and these differences affect their consumption behavior (Rizkitysha and Hananto, 2022). According to research conducted by PPIM UIN Jakarta, Generation Z has a low level of religiosity (PPIM UIN, 2021). This could be because the religious education curriculum in Indonesia does not emphasize ethical consumption aspects and pro-environmental behaviors but focuses more on teaching monotheism and daily worship practices (Kasri et al., 2021). Although religiosity does not directly influence the reduce, reuse, and recycle intentions of Generation Z, it indirectly affects these intentions through feelings of guilt. The level of religiosity among Generation Z motivates them to manage food waste by inducing feelings of guilt.

CONCLUSION

This study aims to identify the factors driving the intention to manage food waste among Indonesian Muslims and to compare different effects between generations. Several variables examined include anticipated guilt, sense of community, awareness of consequences, environmental knowledge, financial concern, religiosity, and 3R intentions. The findings indicate that feelings of guilt due to food wastage, sense of community, environmental awareness and knowledge, concern for the economic value lost from food waste, and the level of religiosity among Generation Y and Z influence their intentions to manage food waste. However, the cost of recycling food waste poses a barrier for both Generation Y and Z.

Through multigroup analysis, Generation Y has more factors driving their intention to manage food waste than Generation Z. However, Generation Y is more reluctant to store and reuse food leftovers, so this feeling does not influence their intention to reuse leftovers. The low awareness among Generation Z regarding the economic value lost from food waste makes them prefer to discard food rather than reuse leftovers. Furthermore, the level of religiosity among Generation Z does not affect their intention to manage food waste.

These factors are relevant as a reference for determining policies or campaigns to promote specific food waste management behaviors for each generation. Campaign approaches can begin from each

generation's closest environment, such as family and close friends, to establish habits in preventing and reducing food waste. Collaboration among various parties, such as government, social organizations, and relevant stakeholders, is needed. In these efforts, collaboration with public figures or influencers who can influence Generation Z and respected religious figures for Generation Y can be an effective strategy. Leveraging the internet and social media is essential for disseminating information on managing household food waste. Innovative approaches, such as captivating visual content and interactive videos, can be shared across multiple social media platforms.

The limitation of this study is the broad distribution of data (divided between Java and non-Java islands). Hence, upcoming studies could analyze more specific data at the provincial level to better portray Indonesia's demographic diversity. Furthermore, future research could investigate the factors influencing Generation X in managing food waste. Additionally, enriching the analysis by comparing behaviors across groups with socio-demographic characteristics other than age/generation could be beneficial. Lastly, incorporating the influence of positive emotions, such as feelings of pride, in fostering intentions for Food Waste Management (FWM) could also be considered.

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