THE PREDICTING EFFECTS OF ATTITUDE, SUBJECTIVE NORM, PERCEIVED BEHAVIORAL CONTROL ON THE INTENTION TOWARDS FOOD WASTE REDUCTION BEHAVIOR AMONG MALAYSIAN YOUNG ADULTS

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A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE BACHELOR OF SOCIAL SCIENCE (HONS) PSYCHOLOGY, FACULTY OF ARTS AND SOCIAL SCIENCE UNIVERSITI TUNKU ABDUL RAHMAN

APRIL 2023

The Predicting Effects of Attitude, Subjective Norm, Perceived Behavioral Control on the Intention towards Food Waste Reduction Behavior Among Malaysian Young Adults

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A research project submitted in partial fulfillment of the requirement for the Bachelor of Social Science (Hons) Psychology, Faculty of Arts and Social Science, Universiti Tunku Abdul Rahman. Submitted on April 2023.

Acknowledgement

We would like to express our sincere gratitude to Dr Gan Su Wan, our supervisor for this undergraduate final year project. Her dedication in guiding us throughout the two trimesters motivated us in completing this final year project. This project would not have been possible without her feedback and advice, that supported us along the way.

Besides, we would like to thank all the participants who willingly spent their time to complete the survey, which was crucial in gathering data for this study. Your participation and contribution are highly appreciated.

Finally, we are grateful for the support of our peers and families who provided emotional, mental and social support throughout the completion of this study. We acknowledged the effort of each peer, and the encouragement we gave to one another to accomplish the final year project.

Thank you all for your invaluable time and contributions.

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Approval Form

This research paper attached here to, entitled "The Predicting Effects of Attitude, Subjective Norm, Perceived Behavioral Control on the Intention towards Food Waste Reduction Behavior Among Malaysian Young Adults" prepared and submitted by "Chan Hooi Mui, Shirley Lok Xiao Rui, and Tee Hui Lin" in partial fulfilment of the requirements for the Bachelor of Social Science (Hons) Psychology is hereby accepted.

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Abstract

This quantitative cross-sectional study aimed to examine the applicability of the Theory of Planned Behavior (TPB) in the context of food waste reduction behavior (FWRB) among young adults in Selangor, Malaysia. This study investigates the predictive effects of each factor within the model and the mediating effect of intention. Data was collected through purposive and snowball sampling by employing both online and paper-and-pencil methods. A total of 167 respondents that met the inclusion criteria were processed. Descriptive analysis, regression analysis, and mediation analysis using PROCESS macro were used to analyze the data. The results of the regression analysis revealed that the significance of the predictive effects of each factor examined were consistent with TPB. Mediation analysis results indicated that intention significantly mediates the relationship between attitude, subjective norm and perceived behavioral control with FWRB. Thus, all eight hypotheses were supported with perceived behavioral control serving as the strongest predictor of intention to engage in FWRB. This study's implications and limitations were discussed. The findings can be used to support future research when investigating additional predictors and to guide interventions in the promotion of food waste reduction practices.

Keywords: attitude, subjective norm, perceived behavioral control, food waste reduction behavior, FWRB

Declaration

We declare that the material contained in this paper is the end result of our own work and that due acknowledgement has been given in the bibliography and references to ALL sources be they printed, electronic or personal.

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List of Abbreviations

AT	Attitude
AVE	Average Variance Extracted
B	Unstandardized Coefficients
CI	Confidence Interval
DOSM	Department of Statistics Malaysia
EDA	Exploratory Data Analysis
EU	European
FWRB	Food Waste Reduction Behavior
INT	Intention
LL	Lower Limit
NAM	Norm Activation Model
PBC	Perceived Behavioral Control
SD	Standard Deviation
SERC	Scientific and Ethical Review Committee
SN	Subjective Norm
SPSS	Statistical Package for Social Science
SWCorp	Solid Waste and Public Cleansing Management Corporation
TIB	Theory of Interpersonal Behavior

TPB	Theory of Planned Behavior
UL	Upper Limit.
UTAR	Universiti Tunku Abdul Rahman
β	Standardized Coefficients

Chapter 1

Introduction

Background of Study

Food waste has been shown to be a growing global environmental, social and ethical problem that has led to critical and negative impact on the economy and environment overall. About 14% of food produced is wasted in retail at the consumption level globally. Approximately 17% of total food production waste is broken down into 11% waste in households, 5% waste in food service and 2% waste in the retail (United Nation, 2022). Food loss and waste have undermined the sustainability of the global food system. The consequence of wasted food is that all resources are used in the production of food (e.g., water, land, energy, labor, and capital). In addition, the food waste causes huge damage to the landfills which can further lead to climate change (e.g., greenhouse gas emissions).

Besides, food loss is shown to negatively affect food security and food availability, contributing to the increase of food cost. Past studies have shown that food and agriculture have led to one quarter of greenhouse gas emissions in the world. The evidence also showed various environmental impacts such as carbon dioxide emissions, garbage production and contamination, renewable energy exploitation (Ritchie, 2019; Stenmarck et al., 2016). Furthermore, food waste has also contributed to individual health concerns such as food insecurities and malnutrition (Thyberg & Tonjes, 2016). According to Mondéjar-Jiménez et al. (2016), the youths in Italy and Spain showed the most inclined segment of population to food waste behavior. So, it is crucial that food waste reduction has been a challenge despite many consequences observed from food waste behavior (Russell et al., 2017). At the same time, it is found a lack of studies in Malaysia studying the behavior of reducing food waste in Malaysian's young adult population (Jamaluddin et al., 2020). Hence, it is interesting to find

out whether young people intend to take immediate action in reducing food losses and waste in the community. This study would like to investigate how likely it is the community carry out food waste behavior to reduce the food waste crisis, especially among young adults in the community. Several factors that lead to the behavior will be studied. Theory of Planned Behavior (TPB) will be used to support the study of the predicting factors on the intention towards reducing food waste in Malaysia young adults' population.

Problem Statement

Malaysia is a multicultural country, and it has an estimated population size of 32.9 million (DOSM, 2022). Its diverse cultural heritage has given rise to a variety of cuisines which became the pride of many Malaysians today. Unfortunately, this well-celebrated food culture coupled with increased food accessibility which results from economic growth have contributed to the food waste culture among Malaysians (Amirudin, 2019). According to Pillay (2018), approximately 20,087.5 tons of perfectly edible food were tossed into the bin every day during the holy month of Ramadhan in 2018. Ramadhan was supposed to be the time for us to distance ourselves from self-indulgence and yet, Solid Waste and Public Cleansing Management Corporation (SWCorp) reported that Malaysians have squandered about 615,000 tons of food which was sufficient to feed about half of our population three meals a day for a month (Pillay, 2018). It is important to remember that Ramadhan is just one of the many festive seasons celebrated in this multiethnic country. There are Chinese New Year, Deepavali, Hari Raya Puasa and many more. These festivals have been associated with up 50% increase in food waste amount when compared to non-festive periods as reported by SWCorp (Ramli et al., 2022). This is not surprising as Malaysians, regardless of their ethnicities, love to celebrate with food and ensuring the service of plenty of food is a form of good hospitality for their guests.

Although a food wastage of this scale is usually limited to festive period only, Malaysians are still throwing out a whopping 17,007 tons of food waste daily and 24% (approximately 4,081 tons) of the total are still edible (Yuen, 2022). According to Rangga et al. (2019), 90% of these organic wastes usually end up in our landfill given that landfilling is the most economical disposal method. However, this waste management method comes at a huge environmental cost. Most landfills in Malaysia are without proper protective measures installed which can lead to many environmental and health issues such as ground water contamination and the release of toxic gases (Rangga et al., 2019). Recently, the Tanah Merah landfill located in Negeri Sembilan was temporarily shut down after the toxic leachate, which originated from the landfill, spilled into Sungai Anak Air Unyai (Singh, 2022). This is a potentially dangerous incident, and it was fortunate that the only casualties from this crisis were a few unsuspecting cattle that drank from the contaminated river. On top of that, if this worrying consumer-related food waste trend were to continue, it would be increasingly difficult for our country to reduce the intensity of greenhouse gas emission by 45% in 2030 which is part of our national action plan to combat climate change (Daim, 2021). This is because when organic waste ends up in landfill, they decompose anaerobically and release methane which is a very potent greenhouse gas (Dickie, 2022). Thus, it is crucial to examine the factors related to food waste behavior among Malaysians.

Given the magnitude and negative implications of food wastage, many parties have increasingly shown interest in this phenomenon. In Malaysia, many non-governmental organizations (e.g., Kechara Soup Kitchen and What A Waste) have proactively spearheaded various programs to fight against food waste (Ahmad & Kasinathan, 2022). Most of the efforts commonly focus on preventing retailers or food and beverage industry players from discarding edible food or ingredients. These food items are collected and then redistributed to those who need them, especially underprivileged individuals like homeless individuals or

B40 households. There are also efforts in Malaysia that highlight on turning food waste into useful entities. For instance, SIRIM has successfully created an Anaerobic Digestion System that can turn food waste into biogas and bio-fertilizer (Ramzi Sulaiman & Ahmad, 2018). This system is already set up and running in Melaka and Port Dickson to manage food waste coming from several selected food courts and hotels (Chen, 2017). For its latest plan to install the same system in Dengkil, it is expected to save up to RM4.7 million incurred by landfilling cost and prevent roughly 9,000 tons of greenhouse gases from being released into the atmosphere over its 10 years of operation. However, since end consumers are significant contributors to food waste, it is reasonable to also direct our resources to instill and encourage food waste reduction behavior such as using a grocery list when shopping and buying only what is necessary. This can be implemented through public education on ways to reduce food waste as illustrated by MYSaveFood initiatives (MYsavefood, n.d.; Ramzi Sulaiman & Ahmad, 2018). The importance of knowledge and awareness in behavioral change has been highlighted by the transtheoretical model (stages of change) (Prochaska & Velicer, 1997). However, these initiatives have yet to produce visible results given that the amount of food waste in Malaysia remains high for the past 3 years (Yuen, 2022). Thus, it is important to understand and examine factors that can influence an individual's food waste reduction behavior so that we can develop more effective food waste tackling initiatives.

Speaking of food waste behaviors, Bilska et al. (2020) and Karunasena et al. (2021) discovered that young people are more likely to commit food waste. A study conducted in 27 European countries revealed that households with young individuals tend to generate a larger amount of food waste (Secondi et al., 2015). Due to their limited experience, young consumers are more likely to inaccurately estimate their meal portion size which often leads to more food wastage (Buzby & Hyman, 2012). In addition to that, younger generations are generally lacking in food management skills which are related to planning, shopping, storing,

preparing and disposing. For example, when it comes to disposing of food, it is important to know how to recognize bad food from those that are still edible. Some fruits or vegetables may look ugly on the outside but are still safe to consume. Besides that, knowing what each food labels (e.g., best-before and use-by dates) means it is also equally crucial in preventing perfectly edible food, fruits or vegetables from going down the bin (Karunasena et al., 2020). This unfamiliarity with food management skills could contribute to the lack of perceived behavioral control in reducing food waste among the young generations. This notion is supported by Jia et al. (2022) which found that younger consumers have a relatively low level of perceived behavioral control. They may assume that reducing food waste is a difficult or an impossible feat and thus, continue to engage in food wastage behaviors.

According to the study done by Phooi et al. (2022), the level of awareness surrounding food waste is high among Malaysians and this finding is also supported by Salleh et al. (2020) who examined Malaysian youths. In both studies, more than 70% of the participants understood the negative impact of food wasting behaviors on various aspects such as our environment, economy and finance. Zepeda and Balaine (2017) also concur that younger consumers tend to display greater levels of concern towards matters pertaining to food wastage. However, unfortunately this awareness did not translate into food waste reduction behaviors as expected. This could be influenced by other factors that are worth examining such as individual attitude towards food waste reduction behaviors. Most Malaysians believe that wasting food is wrong, but they display distinctive attitude towards different food waste reduction behaviors. For example, they prefer to take actions to manage the environmental impact of the food waste that they produced (e.g., use food waste as animal feed or turn the waste into compost) instead of preventing the waste from happening in the first place (Phooi et al., 2022). This is a cause for concern as according to Papargyropoulou et al. (2014), the most effective way to resolve food waste is through preventive measures and

yet, it is not highly favored by Malaysians. Phooi et al. (2022) stated that the top three reasons that contributed to food waste among Malaysians are expired food, spoilt food or food that are no longer fresh. This waste could have been easily prevented if they had planned their shopping and meals to ensure that they did not buy excessively and consume the food before it goes bad.

As aforementioned, the younger generations, particularly university students, are among the most wasteful groups in terms of food consumptions (Marek-Andrzejewska & Wielicka-Regulska, 2021). However, it is also undeniable that these young individuals are actively involved in zero-waste initiatives (Sumiani, 2018). The observed contradictory behaviors within the young adult demographic highlights the fact that this group is not homogeneous. This necessitates further investigation into factors that contribute significantly to the development food waste reduction behaviors. Given that intention is a critical determinant of behavior in various theories, it is worthwhile to explore how behavioral intentions mediate the relationship between various factors and behaviors that can help reduce food waste (Conner & Norman, 2022). To date, there are very few studies that study the factors that influence food waste reduction behaviors in Malaysia with behavioral intention as the mediator and even fewer that specifically examine our young adult populations. Studies that investigate young generations are limited to university students which exclude young individuals who decided to not further their tertiary education (Jamaludin et al., 2020; Selahudin et al., 2020; Teoh et al., 2021). Tapsir (2019) reported that Malaysian's tertiary enrolment rates is approximately 44% for those who aged between 17 and 23 years old. Thus, we may not be able to generalize the current findings that we have to all young adults in Malaysia. As mentioned, younger generations have been associated with higher food waste behavior. Thus, we hope the findings in this study are useful in informing

the development of effective intervention that target food waste behaviors among young Malaysian adults.

Research Objectives

1. To investigate whether attitude significantly predicts intention to reduce food waste.
2. To discover whether subjective norm significantly predicts intention to reduce food waste.
3. To research whether perceived behavioral control significantly predicts intention to reduce food waste.
4. To study whether perceived behavioral control significantly predicts food waste reduction behavior.
5. To examine whether intention significantly predicts food waste reduction.
6. To examine the mediating effect of intention on the relationship between attitude and food waste reduction behavior.
7. To investigate the mediating effect of intention on the relationship between subjective norm and food waste reduction behavior.
8. To examine the mediating effect of intention on the relationship between perceived behavioral control and food waste reduction behavior.

Research Questions

1. Does attitude significantly predict intention to reduce food waste?
2. Does subjective norm significantly predict intention to reduce food waste?
3. Does perceived behavioral control significantly predict intention to reduce food waste?
4. Does perceived behavioral control significantly predict food waste reduction?
5. Does intention significantly predict food waste reduction behavior?

6. Does intention mediate the relationship between attitude and food waste reduction behavior?
7. Does intention mediate the relationship between subjective norm and food waste reduction behavior?
8. Does intention mediate the relationship between perceived behavioral control and food waste reduction behavior?

Research Hypotheses

H_1: Attitude significantly predicts intention to reduce food waste.

H_2: Subjective norm significantly predicts intention to reduce food waste.

H_3: Perceived behavioral control significantly predicts intention to reduce food waste.

H_4: Perceived behavioral control significantly predicts food waste reduction behavior.

H_5: Intention significantly predicts food waste reduction behavior.

H_6: Intention has a mediating effect on the relationship between attitude and food waste reduction behavior.

H_7: Intention has a mediating effect on the relationship between subjective norm and food waste reduction behavior.

H_8: Intention has a mediating effect on the relationship between perceived behavioral control and food waste reduction behavior.

Significance of Study

The findings of this study help to promote awareness of food waste behavior of Malaysian young adults. As past studies revealed that young adults are aware of the negative impact of food waste, but no action taken, these findings can help us to understand the attitude, intention and behavior of young adults in food reduction activity. Thus, intervention

strategies to be proposed to assist young adults in taking action and actively engaging for food reduction behavior and encourage energy-efficient programs among Malaysian young adults.

The findings of this study will help to offer insights into important factors that influence food waste reduction behaviors among the Malaysian young adults. The amount of food waste is increasing gradually every year in Malaysia, and it is becoming crucial. Therefore, the identified important factors can be included by the relevant authorities when developing solutions to reduce food waste in Malaysia.

Conceptual Definition

Food Waste

Food waste refers to food that is meant for human consumption but was discarded at consumer or retail levels (Natural Resources Management and Environment Department, 2013). It includes food that was initially fit for consumption but was left to spoil or was not consumed until it has gone past its expiration date (Ishangulyyev et al., 2019).

Intention

Intention refers to the extent of one can control their responses by purposefully wanting to make an actual result (Guchi & Syafrizal, 2022). It can be understood as one's motivational factor or readiness to carry out a particular behavior. Thus, as the strength of an individual's intention to carry out a behavior increases, there is a higher likelihood for the behavior to occur (Ajzen, 1991).

Attitudes

Attitude refers to an individual's evaluation of a particular behavior (Ajzen, 1991). It can be understood as the affective, cognitive, and behavioral responses to the attitude object to be pressure for evaluatively consistent with one another (Ajzen, 2012).

Subjective Norm

Subjective norm can be defined perceived expectation of others who are significant to an individual, or the societal pressure to participate in a specific behavior such as food wasting (Jamaludin et al., 2020).

Perceived Behavioral Control

Perceived behavioral control refers to an individual's perception of their ability to conduct or have control over a specific behavior (Ajzen, 1991). An individual's level of perceived behavioral control depends on the number of available resources and the barriers to carrying out the target behavior (Hardin-Fanning & Ricks, 2017).

Food Waste Reduction Behavior

Food waste reduction behavior refers to actions or strategies taken to reduce the amount of food waste produced (Attiq et al., 2021). There are behaviors related to food waste reduction when eating out such as avoid over-ordering and pack any leftovers (Wang et al., 2022). There are also behaviors that are relevant to food waste reduction in household such as plan and purchase necessary food or ingredients, make use of leftovers and proper storage of food and ingredients (Stancu et al., 2016).

Young Adults

Young adulthood is the transition period from when one is an adolescent to when one becomes an adult. This developmental period is associated with its own set of developmental tasks that revolve around gaining clarity about one's personal identity and belief system as they become more autonomous and independent. Thus, the age group for young adults in Malaysia are 18 to 25 years old (Higley, 2019; Society for Adolescent Health and Medicine, 2017).

Operational Definition

Attitude

Attitude towards reducing food waste will be assessed using six items from T'ing et al. (2021). Each item is rated on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The average score is computed. A higher mean score indicates a more positive attitude towards reducing food waste.

Subjective Norm

Subjective norms around food waste reduction will be measured using five items used by T'ing and her colleague (2021). This construct is measured on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The average score is computed. A higher mean score reflects a stronger social pressure to reduce food waste.

Perceived Behavioral Control

Perceived behavioral control over food waste reduction will be captured using five items taken from T'ing et al. (2021). The items are measured on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The average score is computed. A higher mean score indicates greater control at individual level over reducing food waste.

Intention

Intention to reduce food waste will be measured using five items from T'ing et al. (2021). Responses to each item will be measured on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The average score is computed. A higher mean score reflects a stronger intention to reduce food waste.

Food Waste Reduction Behavior

Food waste reduction behavior will be measured using six items adapted from Lin and Hsu (2013). Each item is measured on a 7-point Likert scale which ranges from 1 (*strongly disagree*) to 7 (*strongly agree*). The average score is computed. A higher mean score indicates a greater level of participation in food waste reduction.

Chapter 2

Literature Review

Attitude

Attitudes emerge from the belief that a person holds towards the subject of the attitude. In general, a person establishes beliefs about an item by connecting it with characteristics, specifically, in relation to other things, traits, or experiences. When it comes to attitudes toward a behavior, every belief connects the person's behavior to a particular outcome (Ajzen, 1991). Therefore, attitudes can be defined as a general indicator of an individual's willingness to engage in a given behavior. On the other hand, attitudes also indicate the judgment of an individual towards a behavior on whether as a positive behavior or a negative behavior (Ajzen, 1991).

Besides, attitudes also play a significant role in changing a person's behavior (Stangherlin & Barcellos, 2018). Based on Loh et al. (2021), individuals who have a more positive attitude about a behavior are more likely to engage in that behavior. For example, young adults will intend to reduce food waste only if they believe food waste reduction behavior is useful and beneficial and will result in favorable outcomes. According to Evans (2012) and Watson & Meah (2012), it has been found that wasting food makes a person worry and feel "bad", which shows that people had negative attitudes towards this food-wasting behavior. Moreover, a study by (Goh & Jie, 2019) found that young adults may have positive and negative attitudes towards food waste behavior in which positive attitude such as better food quality, and negative attitudes such as bad for the environment.

Subjective Norm

Subjective norm can be defined as perceived expectations of others who are significant to an individual, or the societal pressure to participate in a specific behavior such as food wasting (Ajzen, 1991). In terms of food waste behavior, subjective norm is the degree of an individual's wasteful actions would be supported or rejected by others that they considered as significant (Stancu et al., 2016). Therefore, the decision-maker requires their behavior to be approved by the norms and beliefs of their significant others to make them to participate in particular behavior (Visshers, 2016). According to Ajzen (1991), normative beliefs that rely on an individual's acceptance or rejection of a specific behavior serve as the foundation for the subjective norms.

A study by Wong et al. (2020) found out that positive subjective norms will have a negative impact on food-wasting behavior; on the other words, food waste reduction behavior will increase by having positive norms. Besides, a study by Qi and Roe (2016) recommended that guilt feeling which is also known as moral norm to encourage people to reduce food waste behavior. This idea is intended to help society holistically to adopt a less wasteful approach towards food handling matters. On the other hand, it should be noted that a person's behavior typically conforms to social norms. According to Nikolaus (2018), young adults tend to reduce food waste mainly because this behavior is implanted in their social norm. Therefore, it was also highlighted that parental and peer influences play a significant role in the social norm around food waste reduction among young adults.

Perceived Behavioral Control

Perceived behavioral control can be defined as the extent to which an individual acknowledges their ability to conduct or have control over a specific behavior. The possibility of behavioral success might be determined by the opportunities and resources that are accessible to an individual (Ajzen, 1991). In terms of food waste reduction behavior,

perceived behavioral control can be interpreted as individuals' awareness that they have ability to control the quantity of the food waste (Visshers, Wickli & Siegrist, 2016).

Intention

Intention behind an act will lead to the behavior (Ajzen, 2015). Many past studies have highlighted that intention showed good determinants of the behavior (Guchi & Syafrizal, 2022; Teoh et al., 2021, Graham-Rowe et al., 2015). In relation to food waste, according to study by Visschers et al. (2016), the intention of food waste reduction was assumed to be associated with the amount of food wasted. Higher intention towards food waste reduction shows the result of lower food waste. intention significantly predicts how likely one would reduce food waste.

Food Waste Reduction Behavior

Food waste reduction behavior refers to the minimization of food disposal and loss practices (Attiq et al., 2021). Muhammad Arif et al. (2018) refers food waste reduction behavior as pro-environmental behavior. It carries a purpose to seek consciously and consistently to reduce the negative consequences of one's actions on the environment. Additionally, poor food waste reduction behavior can lead to the damage of environmental quality, which has captured the attention of researchers and policy makers in the food waste issue (Klöckner, 2013).

Theoretical Framework

The Theory of Planned Behavior (TPB) by Ajzen (1991) is a theoretical framework designed to predict and explain human behavior in certain settings. TPB can be used to address the nature of human social behavior (Ajzen, 1991). Besides, the Theory of Planned

Behavior is considered a framework for evaluating the behaviors of an individual and actions from their viewpoint, decision-making factors, and the environment (Russell et al., 2016).

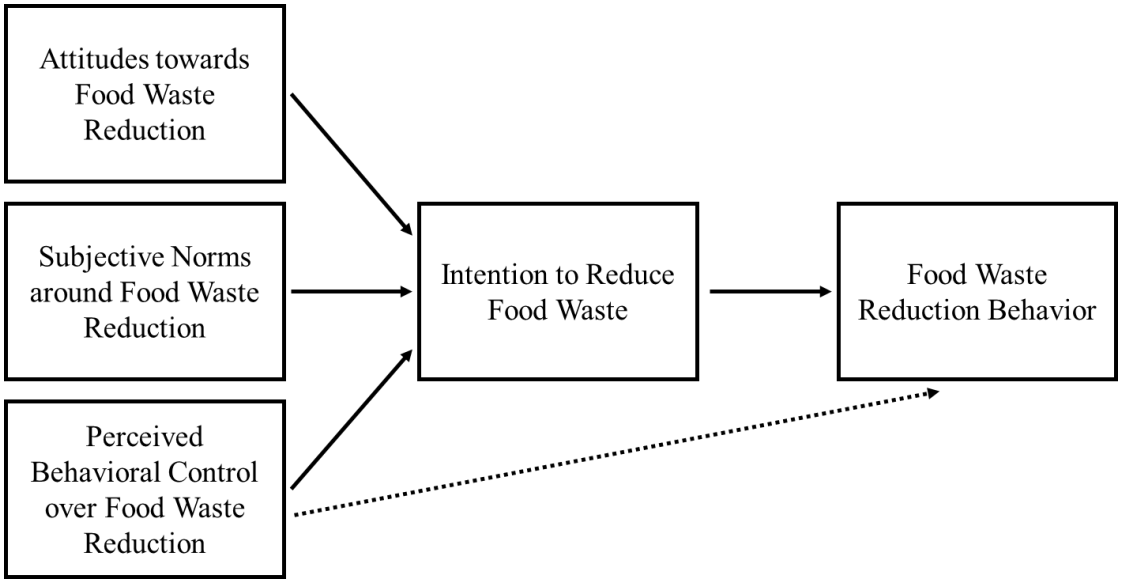
This theory used attitude toward the behavior, subjective norm, perceived behavioral control, behavioral intention, and behavior as its' variables (Ajzen, 1991). Attitude is a fundamental indicator of how positively an individual views a specific behavior. Besides, the subjective norm is the combination of the perceived expectations of the significant others, or the societal pressure to participate in a specific behavior. Moreover, perceived behavioral control indicates how much a person believes they have the ability to conduct a specific behavior (Russell, 2017). According to TPB, individuals' intentions to participate in particular behavior are increased when they have a positive attitude toward that behavior. Once an individual assumes that their significant others anticipate them to participate in a specific behavior, their intentions will be increased. Furthermore, the intention will also be boosted when an individual believes that they have enough control and ability to perform well in the intended behavior (Ajzen, 1991).

According to Ajzen (1991), it implies that behavior is influenced by intention; on the other hand, intention is predicted by attitude, subjective norm, and perceived behavioral control. Although TPB claims intention is the primary cause of the behavior, it acknowledges that perceived behavioral control could also impact a person's behavior. This means that perceived behavioral control not only has an indirect impact on a person's intention but is also able to directly affect a person's behavior. The TPB implies that attitudes, subjective norms, and perceived behavioral control naturally and consistently shape the intention and behavior of an individual. Following, this study investigates the predicting effects of attitudes, subjective norms, perceived behavioral control, and intention toward food waste reduction behavior among Malaysian young adults using the Theory of Planned Behavior.

Conceptual Framework

Figure 1.

Conceptual Framework of Predicting Effects of Attitude, Subjective Norm, and Perceived Behavioral Control on the Relationship of Intention towards Food Waste Reduction Behavior



The purpose of this study is to examine the meditating role of intention to reduce food waste in food waste reduction behavior among Malaysian's young adults. A conceptual framework driven by the TPB is developed to acquire a better understanding of this issue. This study aims to use TPB model to investigate attitudes towards food waste reduction behavior, subjective norm around food waste behavior, perceived behavioral control related to food waste reduction, and food waste reduction behavior, and the intention towards food waste reduction behavior among the young adults in Malaysia.

Based on the literature review, having positive attitudes towards food waste reduction behavior, subjective norm of approval towards food waste and higher perceived behavioral control related to food waste reduction will increase the intention to reduce food waste; thus, leading to performing food waste reduction behavior. Moreover, perceived behavioral control is shown to have direct predicting effect on the food waste reduction behavior.

Attitude and Intention to Reduce Food Waste

Attitude plays a significant role in changing a person's behavior (Stangherlin & Barcellos, 2018). Based on Gao et al. (2017), individuals who have a more positive attitude about a behavior are more likely to engage in that behavior. Young adults will intend to reduce food waste only if they believe food waste reduction behavior is useful and beneficial and will result in favorable outcomes. In other words, individuals feel positive about the behavior of reducing food waste when they have high intention towards this particular behavior (Aydin & Aydin, 2022; Aka & Buyukdag, 2021). It is mentioned that individuals with strong intention in reducing food waste will keen to engage in positive attitudes towards the food waste reduction behavior (Jamaludin et al., 2020).

Subjective Norm and Intention towards Food Waste Reduction

Subjective norm is the perceived social pressure which influences individuals to behave in a certain manner (Fishbein & Ajzen, 1972). If a particular behavior is perceived to be approved by most of the people or by those who are regarded as important, it can lead to a stronger intention for one to display the mentioned behavior as depicted in the theory of planned behavior (Ajzen, 1985). However, the influence of subjective norms on behavioral intention depends on one's motivation to comply with the views or expectations of others. For example, norm violation tends to evoke greater negative reactions in a collectivistic group than in an individualistic group (Stamkou et al., 2019). Thus, a positive association between subjective norm and behavioral intention is expected to be observed among individuals living in a collectivistic society (e.g., Malaysia) since there is a stronger motivation to behave consistently with the social norm.

To date, there is a substantial number of studies across different contexts that can provide support to this connection including a Malaysian study by Jamaludin et al. (2020)

which investigated university students in Pahang. Jamaludin and his team found that when there is larger social pressure coming from their colleague, the students tend to have a higher intention to reduce food waste. This is because when an individual behaves differently from the social norm, it can trigger feelings of shame or guilt which motivates one to reduce food waste (Gross & Vostroknutov, 2022). However, negative feelings are felt more intensely for internalized norms (Giguère et al., 2014). So, individuals who have been taught and reinforced to reduce food waste since young are less likely to violate social norms than those who are newly introduced to the same norm.

Similarly, Soorani and Ahmadvand (2019) also found that subjective norms significantly influence food waste reduction intention of those who oversee food preparation for their households. They examined two different subjective norms that each could produce a different effect on the intention to reduce food waste. The first type involves the level of disapproval from family members and friends regarding food waste which will encourage the intention to reduce food waste. However, the second type is related to the norms of being a good provider in which providing more or variety of tasty and nutritious food for their family or guests are prioritized before food waste. Both subjective norms are found to significantly influence the respondents' intention showing that intention can be influenced by several norms at the same time. La Barbera et al. (2016), who examined factors influencing undergraduates' food waste behavior, went further and found that the respondents tend to value their families' and friends' approvals more than neighbors, religious groups or political parties. Thus, it is believed that the norms and pressures from people around the young adults will bring a bigger impact to their intention in reducing food waste.

However, there are also studies that produced contradictory findings. According to Stefan and his colleague (2013), a subjective norm of disapproval towards wasting food did not significantly reduce the intention to not waste food. Given that the sample they studied

are mostly oblivious about the negative impact of food waste, it was suggested that maybe subjective norm on its own is not enough to influence the intention to reduce food waste. Similarly, subjective norm does not appear to significantly affect the food waste reduction intention among Malaysians living in highly populated urban cities (T'ing et al., 2021). Maybe the influence of subjective norms on the intention is dependent on the context and Malaysians do not care very much about what others think about their food waste behaviors. However, it is also possible that food waste behaviors are rarely visible to others in Malaysia and thus, those who waste food rarely get negatively evaluated by others (Russell et al., 2017).

The results of the above studies are supported by a meta-analysis carried out by Armitage and Conner (2001) which reviewed studies across various behavioral domains and discovered that subjective norm is the weakest predictor of behavioral intention. Armitage and Conner believe that such findings could be attributed to the usage of single-item scale which is less reliable and valid compared to multi-item scale, but this does not explain the findings of Stefan et al. (2013) since they used a multi-item scale to measure subjective norm and behavioral intention. There is a possibility that age could influence the strength of relationship between subjective norm and behavioral intention. The respondents of Stefan et al. (2013) and T'ing et al. (2021) covered a wide age range and according to Knoll et al. (2015), the degree of conformity is age dependent. Younger individuals are more susceptible to social influence than older individuals. Thus, these contradicting findings on the connection between subjective norms and behavioral intention require us to re-examine them in Malaysian young adult population.

Perceived Behavioral Control and Intention towards Food Waste Reduction

The theory of planned behavior posits that a high level of self-efficacy in carrying out the behavior will predict a high behavioral intention. This is because when an individual perceives fewer barriers and there are sufficient resources to enable them to successfully carry out the behavior, they are more motivated to perform the behaviors and vice versa (Azjen, 1986). Examples of resources that can help in reducing food waste among younger generations are cooking skills and food management skills (Bilska et al., 2020; Karunasena et al., 2021). Compared to their parents, younger adults are lacking these important life skills. When younger individuals become more adept at cooking, they can easily convert leftover ingredients into a meal. These successes in using leftovers will elevate their confidence in their ability to reduce food waste which, in turn, increases their intention to do so.

This relationship between perceived behavioral control and intention is supported by studies done by Visschers et al. (2016) which revealed that perceived behavioral control has the greatest influence on behavioral intentions to reduce food waste compared to the other core components within the theory of planned behavior. Visschers et al. (2016) discovered that if participants perceive that they are in control over the amount of food that they throw out, they tend to waste less food. Similar to previous studies, it was suggested that education on how to manage food or skills training (e.g., how to plan and buy food or ingredients that are necessary only) may have an indirect impact on intention to reduce waste through perceived behavioral control (Bilska et al., 2020; Karunasena et al., 2021). In a different context, Yadav and Pathak (2016) showed that perceived behavioral control is a better and useful predictor of the intention of youth to purchase organic food more than the consumer's attitude. Given that young adults waste more food than the older adults, it implies that most young adults perceive reducing food waste as difficult and challenging. One reasons that may contribute to less experience in food management is that young adults spend less time at home which leads to less time available for managing food (Iranmanseh et al., 2022). Thus, it is believed that it

is important for young adults to feel that they are capable of controlling their behaviors in order for them to develop a greater intention to reduce food waste.

To further extend perceived behavioral influence on behavioral intention, La Barbera and Ajzen (2020) investigated the intention to vote in favor of EU integration among Italians. They discovered that on top of the direct relationship between PBC and behavioral intention, perceived behavioral control also affects behavioral intention by moderating the relative importance of attitude and subjective norm in predicting behavioral intention. For example, when an individual has a strong perceived behavioral control, their attitude will have a relatively stronger effect on intention than the social norm. At the same time, it is worth highlighting that there are studies that reported non-significant moderating effects of perceived behavioral control (Earle et al., 2019; Kothe & Mullan, 2015). Even though it would be interesting to clarify the moderating effect of PBC, we have decided to only focus on the direct relationship between PBC and behavioral intention to reduce food waste in our present study since this is the first step towards understanding this phenomenon among young Malaysian adults which is rarely studied.

Perceived Behavioral Control and Food Waste Reduction Behavior

Previous research by Stefan et al. (2013) has shown that daily routines that are associated with food can influence the perceived behavioral control when it comes to food waste reduction behavior. Besides, Coskun & Ozbuk (2020) examined that the food waste reduction behavior was significantly influenced by the perceived behavioral control. The results of this study showed that food waste behavior will be reduced when there is more perceived behavioral control a person feels they have over their eating habits. Therefore, individuals who believe in their ability to do food waste reduction and think that they have control over their food waste behavior are more likely to have food waste reduction behavior

(Aktas et al., 2018). A study by Blesic (2021) also showed a similar result in which when an individual thinks that their food waste behavior is beyond their control, it will negatively affect their actual food waste behavior. According to Wong et al. (2020), the results showed that Malaysians tend to waste food because they did not make plans for cooking and buying food and they think that it is difficult for them to reduce food waste, This situation of low perceived behavioral control results in an increase in food waste behavior.

Intention and Food Waste Reduction Behavior

In the TPB, intention is the immediate antecedent of the behavior, and this is supported by another psychological theory such as the protection motivation theory which is usually employed in the health context (Ajzen, 1985; Maddux & Rogers, 1983). In the context of food waste, there are many studies across different age groups and countries that support the significant influence that behavioral intention has on behavior itself. For example, in Switzerland, Visschers et al. (2016) found that higher intention to avoid food waste predicted less food waste behavior and in fact, among all the predictors examined in the study, intention is the most important predictor of food waste behavior even across different types of food. However, this study also revealed that there are other factors that need to be taken into account when explaining the relationship between intention and food waste behavior. An example that may be relevant to Malaysian young adults is the habit of ordering too much (Phooi et al., 2022). According to Visschers et al. (2016), a food wasting habit may reduce the strength of the relationship between the intention and food waste reduction behavior.

This relationship between intention and behavior is also observed in youth and university students. Teoh et al. (2021) showed that the food waste reduction intention predicts food waste prevention behavior among university students in Malaysia while Mondejar-

Jimenez et al. (2016) show that Italian and Spanish youths who intends to reduce food waste engage in positive food management behaviors that reduces food waste. Mondejar-Jimenez et al. (2016) added that despite having a strong intention to minimize food waste, youths can easily be influenced by external factor such as price discount or other sales and marketing gimmicks that encourage excessive buying which then leads to more food wastage. Additionally, this relationship also exists outside food waste behaviors such recycling behavior and organic food consumption (Sujata et al., 2019 and Scalco et al., 2017. This supports the generalizability of the relationship between intention and behaviors.

However, even then, intentions rarely explain all the variance observed in behaviors that were carried out. For example, even though Graham-Rowe and his team (2015) showed that intention significantly predicts food waste behavior, intention only accounts for 5% of the variance in behavior. It was suggested that there are other factors that moderate the strength of the relationship between intention and food waste behavior. Some potential moderators are the actual opportunity and resources that are accessible by the individuals and the responses of other family members to the food waste reduction behaviors displayed by the individuals. Other meta-analyses that reviewed the theory of planned behaviors discovered that behavioral intention accounts between 18% and 23% of the variance in behavior observed (Armitage and Conner, 2001; McEachan et al., 2011, 2016). On the very extreme end, Stefan et al. (2013) found a non-significant correlation between intention and food waste behavior after adding planning and shopping habits into the predictive model. However, this result needs to be interpreted with caution because it could be due to the similarity between the constructs for shopping habits and food waste behavior. Another explanation offered by McEachan (2011) is that the type of behavior moderates the strength of the relationship between intention and behavior. Thus, we ought to see how useful intention is in translating into food waste reduction behavior among the young adults in Malaysia.

Attitude and Food Waste Reduction Behavior: Intention as a Mediator

Back in the 1969, a review by Wicker reported that attitude has a weak or almost no relationship with observed behaviors. However, Fishbein and Ajzen (1977) suggested that the reason behind the weak linkage could be due to the incompatibility between the measured attitude and observed behaviors. For example, attitude towards a physical exercise cannot accurately predicts a food reduction behavior. Fishbein and Ajzen (1975) then came up with the theory of reasoned action which postulates that attitude influence behavior by acting on the behavioral intention. Now, there are several studies in the food waste contexts that support this notion. A study by Visscher et al. (2016) reported that individuals who have positive attitudes towards food waste reduction are found to have wasted less food. However, this attitude-behavior relationship disappeared when intention was added into the predictive model. This suggested that intention could play a role as a mediator in this attitude-behavior linkage. The mediating effect of intention is also supported by Stancu et al. (2016) who found that the impact that intention has on food waste behavior are largely contributed by injunctive norms followed by attitudes towards food waste.

In another study by Mondéjar-Jiménez et al. (2016), they assessed the mediator effect of intention between attitude and behavior in the food waste context. This study found that even though attitude is a significant predictor of the participants' intention to reduce food waste, the same attitude did not directly influence the behavior in a significant way. This contradicting finding, however, does not automatically dismiss the mediating role of behavioral intention but in fact it demonstrates the mediating effect. This is because many studies have shown that there are various factors that can moderate the effect of intention on behaviors (Mondejar-Jimenez et al., 2016; Visschers et al., 2016). Thus, a positive attitude may not necessarily translate into the target behavior. Despite this, several food waste

behavioral studies in Malaysia that used theory of planned behavior stop short at behavioral intention because they assume that intention determines the particular behavior (Jamaludin, 2020; T'ing et al., 2021). In order to determine which modifiable factors that contribute significantly to the food waste behavior among young Malaysian adults, this study will examine the effect of attitude on food waste behavior with intention as the mediator.

Subjective Norm and Food Waste Reduction Behavior: Intention as a Mediator

TPB posits that when there is a social pressure to behave in a certain way, an individual will be motivated to comply with the social norm and is thus more likely to perform the behavior (Ajzen, 1991). It suggests that intention mediates the connection between subjective norm and behavior. However, it is hard to conclude whether behavioral intention plays the mediator role given the mixed results from various studies on the relationship between subjective norm and behavioral intention itself. There are studies that demonstrated the subjective norm as a significant predictor of behavioral intention in contexts such as food waste reduction and fruit and vegetable waste management (Abadi et al., 2020; Barone et al., 2019). There are also studies that found non-significant relationship between subjective norm and behavioral intention in the context of food wastage and cigarette smoking (Alanazi et al., 2017; T'ing et al., 2021). This inconsistency perhaps suggests that the relationship between subjective norm and behavioral intention is moderated by another factor such as perceived behavioral control (La Barbera & Ajzen, 2020). Individuals who have higher self-efficacy are less influenced by social pressure. However, if the target behavior were to be perceived as difficult, individuals will tend to conform to social norm.

Despite the uncertainty surrounding the subjective norm-intention connection, Parkour et al. (2013) carried out a longitudinal study in Iran and found that subjective norm is a significant predictor of recycling behavior in households a year later. This finding is also

supported by a study conducted in Malaysia to investigate the recycling behavior among university students (Ramayah et al., 2012). Ramayah and the team reported that among the variables studied, subjective norm was the strongest predictor. This is not surprising given that both Malaysia and Iran are collectivistic countries where social norm plays a significant role in individual's decision-making process (Hofstede, 2001). However, another possible explanation is that when one has been taught to behave according to the social norm since young, this behavior or response could become overlearned and thus, automatic. According to Larsen et al. (2018) this automatic route may not involve the implementation of intention which takes behavioral intention off the mediator role between subjective norm and behavior. Given that there is no conclusive evidence of the mediating effect of intention in the subjective norm and behavior relationship, there is a need to study this in the context of food waste reduction behavior among the Malaysian's young adults.

Perceived Behavioral Control and Food Waste Reduction Behavior: Intention as a Mediator

Perceived behavioral control is believed to rely on accessible control beliefs. The existence of factors that can help or hinder the performance of a behavior is a consideration of these control beliefs, such as, knowledge and skills, and availability of time and money (Ajzen, 2020). Perceived behavioral control describes how easy or difficult a given behavior is seen to be by the person as a result of prior experience and potential challenges. (Ajzen, 1991). Moreover, Ajzen (1991) mentioned that the emphasis of perceived behavioral control is on one's belief that they have control over behavioral performance, which is impacted by their self-confidence and competence in accomplishing it.

One's behavioral intention is the extent of them converting their ability to reduce food waste into actions. According to Van der Werf (2020), perceived behavioral control can serve

as an alternative for behavioral efficacy. People who perceive that they are able to reduce the amount of food waste are more likely to develop positive intention to reduce food waste and leads to food waste reduction behavior (Graham-Rowe et al., 2015). Nikolaus et al. (2018) stated that young adults perceive themselves as unable to manage their food as they have unpredictable schedules, and this leads them to conduct food waste behavior.

Chapter 3

Methodology

Research Design

This study was conducted using a cross-sectional survey design. Cross-sectional design was adopted in which the data collected was done at a single time point. This study aimed to examine the predicting effects of attitude, subjective norms and perceived behavior control on intention towards food waste behavior among Malaysian young adults. Additionally, intention was tested to mediate the relationship between attitude, subjective norm, and perceived behavioral control with food waste reduction behavior. An internet-based survey via Qualtrics and paper-to-pen survey method were utilized, allowing the researchers to recruit larger sample size within the data collection timeframe.

Sampling Procedures

Sampling Method

Purposive sampling, a non-probability sampling technique was adopted to recruit participants. This strategy was used to improve the representativeness of the sample by matching the demographic of the sample to that of the target population (Stratton, 2021). Snowball sampling technique was employed to maximize the reachability of online questionnaires. Participants were asked to share the online questionnaire link to their social circles. For the paper-to-pen method, the researcher team approached the respondents physically as this method was able to generate a higher response rate, with lower missing value data (Ebert et al., 2018). Non-probability sampling was used as the sampling frame for Malaysian's young adults aged 18-25 living in Selangor in year 2022 was unavailable. The

population data by age group for Selangor was last updated by Department of Statistics Malaysia (DOSM) in year 2020 (Department of Statistics Malaysia [DOSM], n.d.).

Sample Size

In this study, Monte Carlo Power was used to identify the sample size required. The statistical power was set at .90. Sample size was then generated for three mediation models since we have three independent variables which are attitude, subjective norm and perceived behavioral control (refer to Appendix _). Sample size computed for mediation model with perceived behavioral control as the independent variable was chosen since it requires the largest sample size of all the three models to detect an effect. So, the sample size proposed by Monte Carlo Power is 134. However, according to Enders (2003), the missing data rate in psychological studies ranges from 15% to 20%. Thus, to compensate for the possibility of missing data, we aim to collect at least 161 responses from our participants.

Participants

The target population of this study were Malaysian young adults aged 18-25 and were currently living in Selangor. Selangor was chosen due to it was the most populous Malaysian state with an estimated number of 7 million population back in July 2022 (DOSM, 2022b). A total of 287 data was collected from the participants. Since food waste tends to be more rampant in areas with larger populations, this makes Selangor one of the major food waste producers in the country (Ujang, 2017).

Study Location

The questionnaire of this study was generated using Qualtrics and distributed through online and on-site methods. The questionnaires were distributed massively via social

networking sites such as Facebook Survey Exchange Groups, Instagram, WhatsApp, Facebook Feed, Messenger, and Microsoft Teams. To recruit larger sample size within the timeframe, the printed questionnaires were also distributed alongside UTAR Sungai Long campus due to the easier accessibility of young adults that fulfilled the study's criteria. To ensure the respondents were in Selangor, the respondent's selection criteria (e.g., Malaysian young adult who lives in Selangor) was included in the demographic section of the questionnaire, and the data will be filtered accordingly using Statistical Package for Social Science (SPSS) Software 23 before conducting data analysis.

Data Collection Procedures

Research proposal that included possible risk or harm that participants might be exposed to and steps to address them was submitted for application of ethical clearance for this study from UTAR Scientific and Ethical Review Committee (SERC) before collecting data from participants. Given that this study involved human participants and their personal data, it is important to ensure the ethical principles which protect the participants' rights and welfare were followed in this study. The ethical code received was referred to as Re: U/SERC/02/2023. After ethical approval, the questionnaire was distributed online, and 48 usable data were collected for the pilot test. These respondents in the pilot test were Malaysian young adults who were not staying in Selangor.

A written invitation and poster were prepared for the online survey consisting of information regarding the study. It informed the participants the purpose of this study, followed by the inclusion criteria, the estimated amount of time taken for completing the survey, potential risks or discomforts they may be subjected to, the confidentiality of their personal data and their rights as participants. This information was conveyed to help the participants to make an informed decision about taking part in this study. Once they

consented to take part in this study, they were directed to the questionnaire section, similar to paper-to-pen questionnaires. The data collection period was held from 13th February 2023 to 5th March 2023.

To maximize the exposure of online survey within the target population of this study, ripple effect was conducted by posting a Qualtrics link in various relevant Facebook groups such as "Survey Exchange Groups", Malaysia University Student Survey Group, "Internship in Malaysia", "Group Selangor", social networking feed, Instagram story, and more. The researcher also approached friends and relatives that fit the criteria of study through instant messaging platforms. All the participants approached were asked to assist in the study by passing the Qualtrics link to any potential participants that they know of. As an appreciation of their effort of participating in this study, they got an opportunity to join a lucky draw contest and it was optional. Three lucky winners were able to receive RM 10 TnG e-wallet transfer by the end of this study.

Inclusion Criteria

The inclusion criteria of this study for both online and printed questionnaires included (1) a Malaysian, (2) young adult aged 18-25, (3) currently lives in Selangor state. Additionally, internet access was required to respond to the internet-delivered questionnaire. As for respondents who went for paper-to-pencil method, inclusion criteria included if they were first time accessing the same questionnaire within the data collection period.

Instrumentations

Attitude

The current study utilized a five-item scale adopted from T'ing et al. (2021) to measure attitude towards food waste reduction behavior. The five items in this scale are rated

based on a 5-point Likert scale, ranging from "*1 = Strongly Disagree*" to "*5 = Strongly Agree*", with no reverse-scoring items included. The mean score is calculated and falls between 1 to 5. Examples of items included "I think reducing food wastage makes me very happy" and "I think reducing food wastage is very good". A greater mean score reflected towards more positive attitude of food waste reduction behavior. T'ing et al. (2021) reported that the attitude scale exhibited good reliability, as shown by a high alpha value of .90, indicating strong inter-correlations between the six items in the skill. Additionally, the scale also demonstrated an acceptable level of convergent validity, with an Average Variance Extracted (AVE) of 0.672, as proven by Hair et al. (2010). Furthermore, the Fornell and Larcker criterion revealed that the square root of AVE of this scale (0.820) was higher than the others, indicating the presence of discriminant validity.

Subjective Norm

The subjective norm related to food waste reduction behavior were evaluated using a five-item scale adapted from T'ing et al. (2021). Participants will rate the items on a 5-point Likert scale, from "*1 = Strongly Disagree*" to "*5 = Strongly Agree*", with higher score indicating greater social pressure to conduct food waste reduction. Examples of items included "People always asked me to reduce food wastage." and "It is expected of me to reduce food wastage". The scale has a great internal consistency with an alpha value of .90, indicating good reliability; and acceptable convergent validity with an AVE of 0.715. Besides, discriminant validity is also established through the Fornell and Larcker criterion, which shows that the square root of AVE for the scale is 0.845 as it exceeded the greatest squared correlation with any other variable.

Perceived Behavioral Control

A five-item scale by T'ing et al. (2021) was adapted in this current study to assess the perceived behavioral control over food waste reduction behavior. This scale used 5-point Likert scale as "*1 = Strongly Disagree*" to "*5 = Strongly Agree*". A higher mean score indicates the greater perceived behavioral control on food waste reduction behavior. Examples of items included "I have the feeling that I can do something about the food wasted in my household." and "People around me make it possible for me to reduce the amount of food wastage". The questionnaire's internal consistency is good, with a computed alpha value of .83, as supported by Nunnally and Bernstein (1994). Additionally, the scale has a reasonable convergent validity, with an AVE of 0.595, exceeding the 0.5 threshold (Hair et al., 2010). Moreover, the Fornell and Larcker criterion suggested the existence of discriminant validity, with the square root of AVE to the scale at 0.722.

Intention

The participants' intention to reduce food waste was assessed with a five-item scale adapted by T'ing et al. (2021). Each item was responded to using a 5-point Likert scale, ranging from "*1 = Strongly Disagree*" to *"5 = Strongly Agree",* with higher mean score indicating greater strength of intention to reduce food waste. Examples of items included "I am willing to make extra effort to reduce food wastage." and "I have a firm intention to reduce food wastage in the future". The scale showed an acceptable internal consistency with an alpha value of .89. Moreover, this scale demonstrated an acceptable convergent validity, with an AVE of 0.703. Furthermore, based on the Fornell and Larcker criterion, there is evidence of discriminant validity for the intention scale as indicated by its square root of AVE, which is 0.838.

Food Waste Reduction Behavior (FWRB)

To examine food waste reduction behavior, a six-item scale adapted by Teoh et al. (2021) was utilized. The responses of each of the items will be evaluated using a 7-point Likert scale ranging from "*1 = Strongly Disagree*" to "*7 = Strongly Agree*", without any reverse-scored item. Examples of items included "I think that in terms of my food waste reduction behavior, I am committed." and "I think that in terms of my food waste reduction behavior, I am actively participating". Moreover, higher mean score reflects a higher level of involvement in food waste reduction behavior. The scale shows a great internal consistency with an alpha value of .92, as supported by Nunccally & Bernstein (1994); and an acceptable convergent validity with an AVE of 0.724, as supported by Hair et al. (2010). Moreover, the Fornell and Larcker criterion confirms the existence of discriminant validity as shown that the AVE's square root for the scale is 0.851. Additionally, this was also supported by the values of Hetrotrait-Monotrait ratio of correlation criterion (HTMT) for the scale that below the recommended threshold of 0.85 (Hair et al., 2019).

Pilot Test

A pilot test was conducted among 56 Malaysian young adults who were not from Selangor through instant messaging platforms such as WhatsApp and Facebook direct message. The responses were collected within five days, from 6th February 2023 to 10th February 2023 and further analyzed by IBM SPSS Statistics version 23. After screening incomplete data, 48 usable data were processed to test the reliability values of attitude, subjective norm, perceived behavioral control, intention, FWRB. The reliability values of variables in pilot test were shown in Table 1.

Data Analysis Plan

Data analysis was proceeded after the data collection was completed. The data from the questionnaire were imported into IBM SPSS Statistics version 23. Data cleaning was performed to eliminate invalid and missing data, including those that did not meet the inclusion criteria. Exploratory data analysis (EDA) was performed to exclude any outliers in our study, such as histogram and Q-Q plot. Preliminary analyses were conducted to run the assumptions of normality through skewness and kurtosis, histogram, and normal Q-Q plot. After excluding the outliers and finishing the assumptions of parametric data, the data were further processed through descriptive data analysis. Descriptive analysis was used to identify the frequency of the study's respondent demographic variables included age, number of respondents, gender, highest education level, current residential city, in-charge of own meals, and currently living with who to analyze the background of respondents in the study. Ranged scores, mean, and standard deviation were analyzed for the study variables (i.e., attitude, subjective norm, perceived behavioral control, intention, and food waste reduction behavior). The data were then processed with inferential analyses via linear regression to run the predicting effects of attitude, subjective norm, perceived behavioral control, and intention on food waste reduction behavior, as stated in the hypotheses ($\boldsymbol{H_1} - \boldsymbol{H_5}$). Additionally, the mediating effect of intention on the relationship between attitude, subjective norm, and perceived behavioral control with food waste reduction behavior were tested, as stated in hypotheses ($\boldsymbol{H_6} - \boldsymbol{H_8}$) using PROCESS macro.

Reliability

Table 1 presents the Cronbach's alpha coefficient for both pilot (n = 48) and actual (n = 167) test. The reliability result for the actual test revealed attitude (α = .76), subjective norm (α = .76), perceived behavioral control (α = .57), intention (α = .71), and FWRB (α

= .87). Hinton et al. (2004) suggested that Cronbach's alpha values more than .50 are considered acceptable.

Table 1

Cronbach's Alpha Coefficient, α of Attitude, Subjective Norm, Perceived Behavior Control, Intention, and Food Waste Reduction Behavior in Both Pilot (n=48) and Actual Test (n=167)

Variable (26-item)	Cronbach's Alpha, α	
	Pilot Test	Actual Test
Attitude (5-item)	.72	.76
Subjective Norm (5-item)	.65	.76
Perceived Behavioral Control (5-item)	.77	.57
Intention (5-item)	.82	.71
FWRB (6-item)	.82	.87

Note. FWRB = Food Waste Reduction Behavior.

Chapter 4

Results

Normality Assumptions

Skewness and Kurtosis

Table 2 shows the skewness and kurtosis for the four variables such as attitude, subjective norm, perceived behavioral control, intention, and FWRB. The acceptable range of skewness and kurtosis is ±2 (Gravetter & Wallnau, 2014). All continuous variables are within the acceptable range of ±2. Therefore, there is no violation of skewness and kurtosis indicator.

Table 2

Skewness and Kurtosis of Attitude, Subjective Norm, Perceived Behavioral Control, Intention, and FWRB in Pilot (n=48) and Actual Test (n=167)

Variables	Skewness		Kurtosis	
	Pilot Test	Actual Test	Pilot Test	Actual Test
Attitude	-0.08	-0.55	-0.59	0.34
Subjective Norm	0.16	-0.58	-0.67	0.63
Perceived Behavioral Control	-0.80	-0.30	1.45	-0.65
Intention	0.02	0.13	-0.19	-0.07
FWRB	0.046	-0.10	-0.41	-0.47

Note. FWRB = Food Waste Reduction Behavior.

Histogram

Subjective norm, perceived behavioral control, intention and FWRB showed normal curve on histogram, while attitude showed slightly rightly skewed curve. Bell-shaped curves were observed among all variables, indicating normal distribution. Hence, there is no violation of normality for histogram indicator. Refer Appendix __.

Q-Q Plot

There was not much deviation as the observed scores of each variable fell closely to the diagonal line which indicates that there is no violation of normality for Q-Q plot indicator. Refer Appendix __.

Conclusion of Normality Testing

In conclusion for normality testing, skewness and kurtosis, histogram and Q-Q plot showed the variables attitude, subjective norm, perceived behavioral control, intention, and FWRB were normally distributed.

Descriptive Statistics

Demographics

Only 167 out of 287 respondents that met the inclusion criteria were processed. 120 data were excluded due to respondents were not from Selangor, missing data, and outliers. Table 3 shows the sociodemographic characteristics of final respondents (N = 167). The result revealed a total of 36.5% male (n = 61), and 63.5% female (n = 106) were included in this study. The ethnicity was presented, with 8.4% Malay (n = 14), 84.4% Chinese (n = 141), 6% Indian (n = 10), and 1.2% Others (n = 2) that included Iban and ethnicity from Sungai Murut. 167 respondents reported their highest education level was at secondary education level (6.6%), pre-university (24%), diploma (5.4%), bachelor's degree (61.7%), and master's

degree (2.4%). Furthermore, the participants were reported staying in 25 different cities in Selangor states, the top three highest cities included Kajang (16.2%), Subang Jaya (13.2%), and Sungai Long (12%). It was reported that 3% never in charge of preparing their own meals, 15.6% rarely in charge of their own meals, 33.5% in charge their own meals sometimes, 22.2% prepare their own meals most of the time, and 25.7% claimed that they in charge of their own meals every day. Moreover, 14.4% of participants are currently living alone, 22.2% with friends, and 53.5% with family or relatives.

Table 3

Sociodemographic Characteristics of Participants (n = 167)

	n	Percentage (%)	Mean	SD
Age	167	100	21.56	1.79
Gender	61			
Male	106	36.50		
Female		63.50		
Ethnicity	14			
Malay	141	8.40		
Chinese	10	84.40		
Indian	2	6.00		
Others	1	1.20		
Iban	1	0.60		
Ethnicity from Sungai Murut		0.60		
Highest Education Level	0			
Primary education level	11	0.00		
Secondary education level	40	6.60		

Pre-university	9	24.00
Diploma	103	5.40
Bachelor’s degree	4	61.70
Master’s degree	0	2.40
Others		0.00
Current Residential City	2	
Bangi	1	1.20
Banting	2	0.60
Batang Kali	3	1.20
Batu Caves	1	1.80
Cempaka	15	0.60
Cheras	1	9.00
Damansara	3	0.60
Gombak	1	1.80
Jenjarom	27	0.60
Kajang	4	16.20
Klang	11	2.40
Petaling Jaya	11	6.60
Puchong	1	6.60
Selayang	5	0.60
Semenyih	2	3.00
Sepang	2	1.20
Serdang	12	1.20
Seri Kembangan	1	7.20
Setia Alam	17	0.60

Shah Alam	1	10.20		
Subang Alam	1	0.60		
Subang Bestari	22	0.60		
Subang Jaya	1	13.20		
Sungai Buloh	20	0.60		
Sungai Long		12.00		
In-charge of Own Meals	5		3.52	1.12
Never	26	3.00		
Rarely (1-2 days per week)	56	15.60		
Sometimes (3-4 days per week)	37	33.50		
Most of the time (5-6 times per week)	43	22.20		
Every day		25.70		
Currently Living with Who	24		2.49	0.74
Alone	37	14.40		
With friends	106	22.20		
With family/relatives		63.50		

Note. n = Frequency; SD = Standard Deviation.

Descriptive Statistics on Study Variables

Table 4 shows the distribution of observed ranged, mean and standard deviation of attitude, subjective norm, perceived behavioral control, and FWRB.

Table 4

Distribution of Mean, Standard Deviation of Attitude, Subjective Norm, Perceived Behavior Control, Intention, and Food Waste Reduction Behavior (n = 167)

Variable	Observed Range	Mean	SD
Attitude	2.60 - 5.00	4.33	0.49
Subjective Norm	1.00 – 5.00	3.38	0.75
Perceived Behavioral Control	1.80 – 5.00	3.64	0.54
Intention	2.80 – 5.00	3.87	0.49
FWRB	3.33 – 7.00	5.26	0.77

Note. FWRB = Food Waste Reduction Behavior. SD = Standard Deviation.

Hypotheses Testing

Linear regression analysis was used to test if attitude, subjective norm, perceived behavioral control significantly predict intention to reduce food waste, perceived behavioral control significantly predicts FWRB, and intention significantly predicts FWRB among Malaysian young adults ***(H₁ – H₅***). Mediation analysis using PROCESS macro was used to test if intention mediates the relationships between attitude, subjective norm, and perceived behavioral control and FWRB ***(H₆ – H₈)***.

H1: Attitude significantly predicts intention of food waste reduction behavior.

Linear regression result showed that attitude ($\beta = 0.39$, $p < .001$) significantly predicted intention to reduce food waste among Malaysian young adults. The model was statistically significant, $F(1, 165) = 29.89$, $p < .001$ and accounted for 15.3% of the variance at .05 level of significance. Hence, ***H₁*** is supported. The regression analysis summary is shown in Table 5.

Table 5

Regression Analysis Summary for Attitude Predicts Intention

Variable	B	Std. Error	*β*	95% CI	*t*-value	*p*
(Constant)	2.19	0.31		[1.58, 2.80]	7.08	< .001
Attitude	0.39	0.07	0.39	[0.25, 0.53]	5.47	< .001

Note. $R^2 = 0.153$. B = Unstandardized Coefficients; *β* = Standardized Coefficients. CI = confidence interval for B.

H2: Subjective norm significantly predicts intention of food waste reduction behavior.

Linear regression result showed that subjective norm (*β* = 0.203, *p* = 0.009) significantly predicted intention to reduce food waste among Malaysian young adults. The model was statistically significant, $F(1, 165) = 7.09$, $p = 0.009$ and accounted for 4.1% of the variance at .05 level of significance. Hence, ***H₂*** is supported. The regression analysis summary is shown in Table 6.

Table 6

Regression Analysis Summary for Subjective Norm Predicts Intention

Variable	B	Std. Error	*β*	95% CI	*t*-value	*p*
(Constant)	3.43	0.17		[3.09, 3.77]	19.94	< .001
Subjective Norm	0.13	0.05	0.20	[0.03, 0.23]	2.66	0.009

Note. $R^2 = 0.041$. B = Unstandardized Coefficients; *β* = Standardized Coefficients. CI = confidence interval for B.

H3: Perceived behavioral control significantly predicts intention to reduce food waste.

Linear regression result showed that perceived behavioral control ($\beta = 0.57$, $p < .001$) significantly predicted intention to reduce food waste among Malaysian young adults. The model was statistically significant, $F(1, 165) = 80.34$, $p < .001$ and accounted for 32.7% of the variance at .05 level of significance. Hence, ***H₃*** is supported. The regression analysis summary is shown in Table 7.

Table 7

Regression Analysis Summary for Perceived Behavioral Control Predicts Intention

Variable	B	Std. Error	β	95% CI	*t*-value	*p*
(Constant)	1.98	0.21		[1.560, 2.402]	9.283	< .001
Perceived Behavioral Control	0.52	0.06	0.57	[0.405, 0.634]	8.963	< .001

Note. $R^2 = 0.327$. B = Unstandardized Coefficients; β = Standardized Coefficients. CI = confidence interval for B.

H4: Perceived behavioral control significantly predicts food waste reduction behavior.

Linear regression result showed that perceived behavioral control ($\beta = 0.36$, $p < .001$) significantly predicted food waste reduction behavior. The model was statistically significant, $F(1, 165) = 24.59$, $p < .001$ and accounted for 13.0% of the variance at 0.05 level of significance. Hence, ***H₄*** is supported. The regression analysis summary is shown in Table 8.

Table 8

Regression Analysis Summary for Perceived Behavioral Control Predicts FWRB

Variable	B	Std. Error	β	95% CI	t-value	*p*

(Constant)	3.39	0.38		[2.64, 4.15]	8.88	< .001
Perceived Behavioral Control	0.52	0.10	0.36	[0.31, 0.73]	8.96	< .001

Note. R^2 = 0.130. FWRB = Food Waste Reduction Behavior. B = Unstandardized Coefficients; β = Standardized Coefficients. CI = confidence interval for B.

H5: Intention significantly predicts food waste reduction behavior.

Linear regression result showed that intention (β = 0.54, p < .001) significantly predicted food waste reduction behavior among Malaysian young adults. The model was statistically significant, $F(1, 165) = 66.61$, p < .001 and accounted for 28.8% of the variance at .05 level of significance. Hence, $\boldsymbol{H_5}$ is supported. The regression analysis summary is shown in Table 9.

Table 9

Regression Analysis Summary for Intention Predicts FWRB

Variable	B	Std. Error	β	95% CI	t-value	p
(Constant)	2.00	0.40		[1.20, 2.79]	4.95	< .001
Intention	0.84	0.10	0.54	[0.64, 1.05]	8.16	< .001

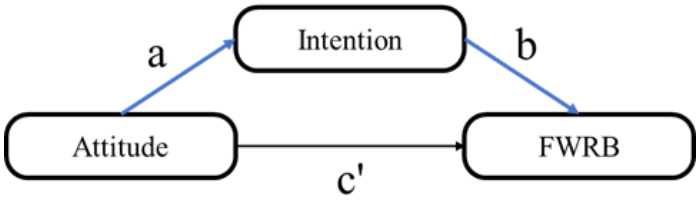
Note. R^2 = 0.288. FWRB = Food Waste Reduction Behavior. B = Unstandardized Coefficients; β = Standardized Coefficients. CI = confidence interval for B.

Mediation Analysis

H6: Intention mediates the relationship between attitude and food waste reduction behavior.

Figure 2

Mediation Model of Attitude, Intention, And FWRB



Note. FWRB = Food Waste Reduction Behavior. Direct effect = a*b, indirect effect = c', total effect = c' + a*b.

The study assessed the mediating role of intention on the relationship between attitude and FWRB, as shown in Figure 2. The results revealed attitude has a significant indirect effect on FWRB (b = 0.28, 95% CI [0.14, 0.44]). If 95% CI does not include zero, the indirect effect was statistically significant (Hayes, 2018). Furthermore, the direct effect of attitude on FWRB in the presence of mediator was also found significant (b = 0.34, *t* = 3.10, *p* = .002). Intention showed full mediating effect on the relationship between attitude and FWRB. Hence, H6 is supported. Mediation analysis of ***H₆*** is presented in Table 10.

Table 10

Mediation Analysis: Attitude, Intention, and FWRB (N = 167)

Relationship	Total Effect	Direct Effect	Indirect Effect	95% CI		*t*-value	*p*
				LL	*UL*		
AT → FWRB		.34				3.10	.002
			.28	0.14	0.44		

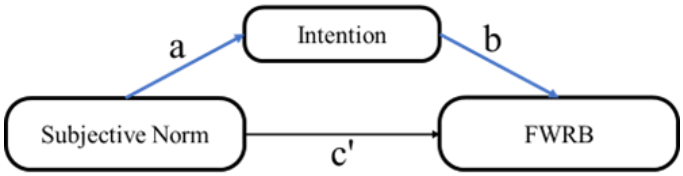
AT → INT → FWRB	.61		5.49	< .001
Total Effect				

Note. AT = Attitude, INT = Intention, FWRB = Food Waste Reduction Behavior. CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

H7: Intention mediates the relationship between subjective norm and food waste reduction behavior.

Figure 3

Mediation Model of Subjective Norm, Intention, And FWRB



Note. FWRB = Food Waste Reduction Behavior. Direct effect = a*b, indirect effect = c', total effect = c' + a*b.

The study assessed the mediating role of intention on the relationship between subjective norm and FWRB, as shown in Figure 3. The results revealed subjective norm has a significant indirect effect on FWRB (b = 0.11, 95% CI [0.03, 0.20]). If 95% CI does not include zero, the indirect effect was statistically significant (Hayes, 2018). Furthermore, the direct effect of subjective norm on FWRB in the presence of mediator was also found insignificant (b = 0.06, t = 0.82, p = .41). Intention showed partial mediating effect on the

relationship between subjective norms and FWRB. Hence, H7 is supported. Mediation analysis of H_7 is presented in Table 11.

Table 11

Mediation Analysis: Subjective Norm, Intention, and FWRB (N = 167)

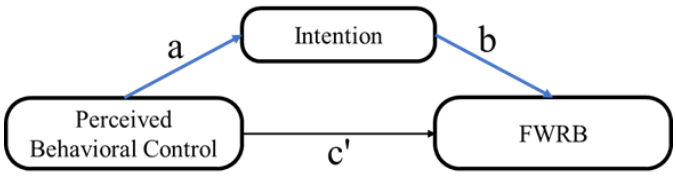
Relationship	Total Effect	Direct Effect	Indirect Effect	95% CI		*t*-value	*p*
				LL	*UL*		
SN → FWRB		.06				0.82	.41
SN → INT → FWRB			.11	0.03	0.20		
Total Effect	.17					2.11	.04

Note. SN = Subjective Norm, INT = Intention, FWRB = Food Waste Reduction Behavior. CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

H8: Intention mediates the relationship between perceived behavioral control and food waste reduction behavior.

Figure 4

Mediation Model of Perceived Behavioral Control, Intention, And FWRB



Note. FWRB = Food Waste Reduction Behavior. Direct effect = a*b, indirect effect = c', total effect = c' + a*b.

The study assessed the mediating role of intention on the relationship between perceived behavioral control and FWRB, as shown in Figure 4. Table _ presented perceived behavioral control has a significant indirect effect on FWRB (b = .40, 95% CI [0.25, 0.58]). If 95% CI does not include zero, the indirect effect was statistically significant (Hayes, 2018). The direct effect of perceived behavioral control on FWRB in the presence of mediator was found insignificant (b = .11, t = 0.99, p = .32). Intention showed partial mediating effect on the relationship between perceived behavioral control and FWRB. Hence, ***H8*** is supported. Mediation analysis of H8 is presented in Table 12.

Table 12

Mediation Analysis: Perceived Behavioral Control, Intention, FWRB (N = 167)

Relationship	Total Effect	Direct Effect	Indirect Effect	95% CI		*t*-value	*p*
				LL	*UL*		
PBC → FWRB		.11				0.99	.32
PBC → INT → FWRB			.40	0.25	0.58		
Total Effect	.52					4.96	< .001

Note. PBC = Perceived Behavioral Control, INT = Intention, FWRB = Food Waste Reduction Behavior. CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

In conclusion, linear regression results revealed there were predicting effects of attitude, subjective norm, perceive behavioral control and intention towards food waste reduction behavior. In addition, all mediation analyses reported that intention has complimentary mediating effect on the relationship between attitude, subjective norm, and perceived behavioral control with food waste reduction behavior. Therefore, all hypotheses ($\boldsymbol{H_1}$ – $\boldsymbol{H_8}$) were supported.

Chapter 5

Discussion and Conclusion

Discussion

Attitude and Intention

***H_1*:** Attitude significantly predicts intention of food waste reduction behavior.

The data collected in this study supports the notion that an individual's attitude is a significant predictor of their behavioral intentions towards reducing food waste among Malaysian young adults in Selangor. Research by Jia et al. (2022) that studied on food waste behavior among China's young adults showed a similar result which attitude is positively correlated to intention to reduce food waste. The researchers mentioned that the perceptions of food waste behavior as irrational and environmentally unfriendly by consumers can elicit emotional responses and promote the intention to reduce food waste among the young adults. Besides, Graham-Rowe et al. (2015) conducted a study that supported the current finding, indicating that individuals with favorable attitude towards reducing food waste were more inclined to express an intention to minimize food waste in their daily lives. Positive attitudes such as thinking reducing food waste will bring positive feeling and positive impact to themselves as well as the society tend to increase the intention of individuals to reduce the amount of food wasted. Similarly, study by Visschers et al. (2016) also showed that intention of food waste reduction behavior was primarily associated with an individual's attitude. The authors categorized the attitudes into three different aspects, which are personal, health and financial attitudes. The present study put more focus on the personal attitudes of an individual, the article supported that having a more positive personal attitudes will have higher intention to lessen the amount of food waste generated.

Besides, the present study's finding is also supported by a study by Marek-Andrzejewska and Wielicka-Regulska (2021) that examined on intentions to reduce food waste of young adults in Poland, which the findings showed that the variable with the greatest significance with intention to food waste reduction behavior was attitude. Youth placed significance on reducing food waste, and this influenced their intentions to reduce food waste. Comparable findings were shown in study by Barone et al. (2019), which attitude was identified as the most influential predictor that affects a person's intention to minimize food waste. Additionally, the research found that among the factors that influenced people's attitudes towards reducing food waste were personal beliefs, understanding of food waste, and consciousness of the effect of food waste on the environment. These findings suggest that Malaysian young adults who think that food waste reduction behavior is significant and think that it will bring benefits will have higher intention to reduce food waste. Other than that, Malaysian young adults will also tend to reduce food waste when they have positive feelings such as happy and feel comfortable during the food waste reduction behavior. Thus, the findings support the hypothesis stating that attitude significantly predicts the intention to lessen food waste among young adults in Selangor, Malaysia.

Subjective Norm and Intention

***H_2*:** Subjective norm significantly predicts intention of food waste reduction behavior.

The findings of the study indicated that individuals' subjective norm significantly predicts their intention to engage in food waste reduction behaviors and Jia et al. (2019) that study on young adults reported similar findings as well. The authors mentioned that the desire to maintain one's reputation can raise the likelihood of food waste by limiting the utilization of leftover food, while adhering to group norms can strongly influence the decision to order smaller portion sizes. It can be seen that the need for younger consumers to uphold their

positive image among their friends may bring impacts on their food waste reduction behavior. Moreover, Visschers et al. (2016) also presented consistent findings which suggested that people tend to have higher intention to lessen the amount of food waste if they think that it was a socially acceptable behavior. The subjective norms are influenced by people who are important to an individual, the social pressure, and the societal expectations around them. According to Stockli et al. (2022), the studies have demonstrated that factors such as, involvement in food waste reduction related campaign, comparison with others and social interaction can influence the subjective norms that linked to food waste reduction behavior. The results of the articles supported the current findings as they discovered that when a person is highly exposed to the subjective norm that highlighted food waste reduction behavior in the society led to higher intention to minimize food waste.

On top of that, a study by Stancu et al. (2016) found out that subjective norms strongly predicted intention in the food waste reduction context, as in the people who believed that reducing food waste is a value shared by their social circle will have stronger intention to display food waste reduction behavior. This can be supported by Tsai et al. (2020) in which the findings showed that young adults tend to practice more self-control to reduce food wasting behavior in order to leave a positive impression on others. The intention of reducing food waste among Malaysian young adults will be higher especially when they received a high expectation from people around them to reduce food waste; hence, they will have the thoughts of leaving a good impression on others. Similarly, Qian et al. (2021) discovered that individuals who have a greater sense of obligation to fit in a society will be more susceptible to the subjective norms and make them intend to involve in food waste reduction behavior in real life. Specifically, it can be meant by individuals that having greater societal pressure to conform to the social groups around them will be led to stronger intention. This can be seen from our findings as 85.7% of our respondents were living with

their friends or family, which boosts them to conform to their social circle. This can be interpreted as Malaysian young adults tend to reduce food waste as they have the social pressure to conform to their social circle. Hence, the findings supported the hypothesis in which subjective norms act as a significant predictor in shaping intention on food waste reduction behavior of young adults in Malaysia.

Perceived Behavioral Control and Intention

***H_3*:** Perceived behavioral control significantly predicts intention of food waste reduction behavior.

The study's result implied that among the three factors examined, the individual's perceived behavioral control is the strongest predictor for intention to exhibit food waste reduction behaviors. This finding aligns with the result from a study by Tsai et al. (2020) that study on the behavior among the emerging adults in China regarding food waste, as the results showed that the perceived behavioral control is positively correlated to the intention. Individuals who possess a comprehensive knowledge of food waste tend to reduce their food waste and make an effort to consume all their food, regardless of its taste. Besides, Graham-Rowe et al. (2015) also showed a similar result in which higher perceived behavioral control strengthens the intention to reduce food wastage. People tend to exhibit greater confidence in their own ability to minimize food waste when they possess a high level of perceived behavioral control (Teng et al., 2020). According to our descriptive results, more than half of our respondents are in charge of their own meals (e.g., preparing their own meals, or bought food from outside) for at least 3 to 4 days per week. As mentioned by Stefan et al. (2013), individuals who feel in control of their food planning will have stronger intention in reducing food waste.-Malaysian young adults who think they can plan for their food shopping and usage are more likely to a higher level of intention on FWR as they have a sense of control

towards their food plans in daily life. Similarly, Van der Werf et al. (2019) shared that people were more intended to practice food waste reduction behavior if they felt more in charge of their food-related behaviors, such as food preparation, food shopping, and food preservation are more intended to participate in food waste reduction behavior.

In agreement with the current study, Jia et al. (2022) concluded that perceived behavioral control acts as a significant variable that impacts the food waste reduction behavior among young adults. The authors found that to strengthen the perceived behavioral control to reduce food waste, young adults require external assistance such as efficient food ordering services, and comprehensive information regarding the food they are ordering. Besides, studies by Coskun and Ozbuk (2020) and Mondejar-Jiminez et al. (2016) reported that perceived behavior control is the most robust predictor of individuals' intention. Moreover, according to Graham-Rowe et al. (2014), social support from peers or family also serves as one of the factors that influence one's self-esteem over the feeling of controlling food waste. Malaysian young adults think that people around them are increasing the possibility for them to reduce food waste. This social support enabled young adults to gain more motivation and knowledge to reduce food waste in daily life. With this, people who acquire sufficient social support might think themselves having more control on food waste and increase tendency to participate in food waste reduction behavior. Therefore, it supported our hypothesis which highlighted that perceived behavioral control significantly predicts one's intention to reduce food waste among Malaysian young adults.

Perceived Behavioral Control and Food Waste Reduction Behavior

***H_4*:** Perceived behavioral control significantly predicts food waste reduction behavior.

According to the study, the food waste reduction behavior can be predicted by the perceived behavioral control of an individual. This finding can be supported by Coskun &

Ozbuk (2020) which the study also found that people with higher perceived behavioral control will have lesser food wasting behavior. Besides, study conducted by Wu et al. (2019) that focused on university students in China which their sample mostly range from 18 to 22 years old, showed a positive correlation between perceived behavioral control and food waste reduction behavior. The authors indicated that there is a direct correlation between an individual's perception of the difficulty in reducing food waste and the amount the food that is wasted. In other words, the more challenging the food waste reduction behavior an individual perceived it to be, the greater amount of food will be wasted. Furthermore, Mondejar-Jimenez et al. (2016) also found similar findings in which perceived behavioral control is positively correlated to the positive behavior of reducing food waste among the Spanish and Italian youths. In the context of our study, when Malaysian young adults think that it is easy for them to reduce food waste, they will have higher intention to conduct the food waste reduction behavior in real life.

Additionally, Visschers et al. (2016) supported the points that having skills and being educated to reduce food waste will increase individuals' self-esteem and help them to be motivated; in which this will make them to have a sense of control on their food waste and increase their perceived behavioral control on food waste reduction behavior. In other words, individuals can enhance their perceived behavioral control through skills training and hands-on experiences that teach them how to manage and reduce food waste at home. People can learn techniques for controlling the amount of food wasted by themselves, as well as methods for accurately determining the necessary amount of food to buy. This will help to make them feel more capable of their food waste reduction behavior. Consequently, people will engage more in reducing food waste. 33.5% of our respondents prepare their own meals 3 to 4 days per weekm and about 25.7% of them prepare their own meal every day. This can be suggested that our respondents thinks that they have the capability to prepare their own meal

and to control their food waste behavior. In this case, our hypothesis that stated that food waste reduction behavior is significantly predicted by perceived behavioral control among Malaysian young adults is supported.

Intention and Food Waste Reduction Behavior

H_5: Intention significantly predicts food waste reduction behavior.

The present study provides empirical support for the fifth hypothesis as postulated by the Theory of Planned Behavior model (Ajzen, 1991). The result demonstrates that the intention to reduce food waste is a crucial factor that can significantly predict the behavior of young Malaysian adults residing in Selangor when it comes to reducing food waste. This finding aligns with previous studies that have examined behaviors in the food waste context but each across different age groups and in different countries (Mondejar-Jimenez et al., 2016; Teoh et al., 2021; Visschers et al., 2016).

The results of both regression and mediation analyses indicate that intention is the antecedent of food waste reduction behavior. Intention can be specified by two elements which are instrumental or goal intention (Conner & Norman, 2021). In our study, we only measure goal intention. Goal intention only specifies the end goal (i.e., I am willing to make extra effort to reduce food wastage.) while instrumental intention focuses on the specific actions to be taken (i.e., I intend to make a grocery list before I go shopping.). After a goal intention is formed, it is usually followed by the formation of implementation intention in which individuals will decide when, where and what action to take in advance (Morwitz & Munz, 2020). With this pre-planned intended behavioral response in place, individuals will only need to carry out their plans when the opportunity to behave as intended arises. There is no need to spend extra time deciding whether to act and how to act. Thus, individuals with the intention to reduce food waste would find it easier to initiate food waste reduction

behavior when the right environmental cue is present compared to those with no intention to do so. On top of that, Ajzen (2019) postulates that in order to form an implementation intention, individuals would need to mentally simulate the entire process of carrying out the behavior. This would give the individuals the opportunity to identify and come up with ways in advance to overcome possible challenges that may impede their intended behavior. With that, intentions can be a reasonable proxy for the actual intended behavior.

However, the regression model indicates that intention accounts for 28.8% of the variance in food waste reduction behaviors among the respondents. Although this coefficient of determination is larger than 5% which was previously reported by Graham-Rowe et al. (2015), it still suggests that food waste reduction behavior cannot be predicted fully with just intention alone. In our study, 47.9% of our respondents in charge of their own meals for 5 or more days per week. On top of that, 63.5% of them were living with their families. Taking these factors into consideration, most of our respondents may not have complete control over the amount of food that they wasted. Without the opportunity to carry out food waste reduction behavior, having high intention may not necessarily translate into the actual behavior. This agrees with what was posited by the theory of reasoned action, behaviors that are completely within an individual control would be easier to enact compared behaviors that require the agreement or participation of other people (Conner & Norman, 2022). Thus, it revealed it is crucial to examine the model with intention and behavior together with other variables to better explain the development of FWRB.

Lastly, in contrast to our findings, Stefan et al. (2013) reported no significant relationship between intention and food waste reduction behavior. There is one possible explanation for this contradictory result. According to Azjen (1991), it is essential to have cognitive and behavior variables that measure the exact same actions to increase the predictive power. However, the study by Stefan and colleagues did not entirely adhere to this

compatibility principle. While they measured participants' general intention to reduce food waste, they measured participants' specific meal planning and shopping behaviors. In contrast, the instruments used in our study reflect a similar level of specificity between intention and behavior. Therefore, this difference in methodology may potentially explain the discrepancy in results between our studies.

Attitude, Intention and Food Waste Reduction Behavior

H_6: Intention has a mediating effect on the relationship between attitude and food waste reduction behavior.

The present study's mediation analysis results provide support for the sixth hypothesis which indicates that intention mediates the association between attitude and the behavior of reducing food waste among young Malaysian adults living in Selangor. The current result aligns with earlier research on food waste behavior as evidenced by studies conducted by Mondejar-Jimenez et al. (2016), Stancu et al. (2016), and Visscher et al. (2016).

There are a few various potential rationales proposed here to elucidate the function of intention in mediating the connection between attitude and behavior. Among these rationales is the concept of cognitive dissonance which is experienced by an individual when there is a mismatch between their attitude and behavior that results in discomfort. According to McGrath (2017), cognitive dissonance can motivate individuals to reduce this discrepancy between attitude and behavior, leading to the formation of intentions to reduce food waste. Therefore, individuals who possess favorable attitudes towards minimizing food waste are typically motivated to adopt behaviors through their intention to minimize food waste.
On top of that, the impact of our attitudes extends beyond our behaviors and can affect the way we seek out information. The confirmation bias phenomenon, as described by Palminteri et al. (2017), characterized the inclination of individuals to selectively pay attention to and

process information that is consistent with their existing beliefs. Thus, whether it is through active or passive attitude-consistent information search, individuals who hold positive attitudes towards reducing waste are likely to be more attentive to practical information on ways to reduce food waste (Verplanken & Orbell, 2022). Thus, the individuals will plan and have higher willingness to perform food waste reduction behavior. This then can motivate the individuals to engage in food waste reduction behaviors.

However, it is important to note that the effect of attitudinal change on behavioral change has been inconsistent, particularly for behaviors that need to be sustained over a long period of time (Wakefield et al., 2010). This is especially relevant to our target behavior which we hope that after Malaysians pick the food waste reduction behavior up, they will continue to practice it throughout their lifetime. Sheeran et al. (2016) discovered that attitude change has a more pronounced effect on behavior when interventions are designed to promote a specific behavior than those that aim to diminish a particular behavior. This is because attitude has a limited influence on past habitual behaviors. Therefore, when designing an intervention that seeks to change behavior by targeting participants' attitude, this aspect should be taken into consideration.

Subjective Norm, Intention and Food Waste Reduction Behavior

H_7: Intention has a mediating effect on the relationship between subjective norm and food waste reduction behavior.

Based on the results of the mediation analysis, it can be concluded that the seventh hypothesis is supported. The findings suggest that intention significantly mediates the association between subjective norm and food waste reduction behavior among young Malaysian adults living in Selangor. This finding diverges from previous research conducted by Stefan et al. (2013) and Mondejar-Jimenez et al. (2016) which did not report any

significant mediating effect of intention on the relationship between subjective norm and food waste reduction behavior.

In the present study, the instrument used to measure subjective norms capture both descriptive and injunctive norms. Descriptive norms refer to the behaviors performed by others while injunctive norms refer to individual's perception of how others think they should think, feel and behave in a particular situation (American Psychological Association, n.d.a, n.d.b). In a collectivistic society like Malaysia, individuals tend to view themselves in relation with other members of the group they are associated with. They are more likely to be considerate of how their behaviors would affect the rest of the members than those who are brought up in an individualistic society (Hui & Triandis, 1986). Thus, it is natural for individuals with collectivistic values to look to their group behaviors to inform how they should behave (Kinias et al., 2014). If the people surrounding them are putting in effort to reduce food wastage, they are more motivated to conform to the descriptive norm than people from individualistic society. In fact, the strength of conformity increases if there is a greater proportion of the people observed performing similar behavior (Leong et al., 2022).

In a collectivistic society, individuals tend to engage more in behaviors that they believe are approved by others and vice versa. They are motivated to follow the injunctive norms because in a collectivistic society, social norms violators are typically being evaluated more harshly, disliked or socially rejected by society (Stamkou et al., 2019). Their "inappropriate" behaviors could also reflect badly on the social image of the people who are close to them. This could explain why individuals from a more ingrained collectivistic culture experience higher psychological distress when they deviate from the social norms than those from less collectivistic culture (Vaswani et al., 2022). Thus, even if it requires them to sacrifice their self-interest such as spending more time to plan their meals or spending more

money to buy proper storage containers, they are willing and motivated to do that which result in higher engagement with food waste reduction behaviors (Fatehi et al., 2020).

As mentioned, in Mondejar-Jimenez et al. (2016) researched on youths in Spain and Italy, they observed that intention did not play a significant mediating role in the relationship between subjective norm and food waste behavior. This disparity in findings could be attributed to the cultural differences stated earlier. In individualistic societies such as Spain and Italy, individuals may place less importance on what other people do or what other people think of their actions (Hofstede Insights, n.d.a, n.d.b). In fact, uniqueness is highly valued. Conversely, in collectivistic societies like Malaysia, conforming to social norms is highly valued and deviating from them is typically met with disapproval (Hofstede Insights, n.d.c). Therefore, if an individual perceives that those around them are engaging in food waste reduction behaviors, they may feel a stronger pressure to conform to these norms. However, the findings of Stefan et al. (2013), which did not support the significant subjective norm-intention and intention-food waste behaviors relationships, appear to contradict the assumption that Romania is a collectivistic society. Several explanations may account for these incongruous results. One possibility is that the mean age of participants in Stefan and colleagues' study was considerably higher (38.2 years old) compared to the younger sample in our study (21.56 years old). According to Knoll et al. (2015), younger individuals are more vulnerable to social influence than older individuals. This is because younger individuals have fewer life experiences to inform their personal views and values (Laursen & Faur, 2022). Thus, they are more easily swayed by external influence and conform to the norms. In addition to that, the majority of our participants (85.7%) were living with their friends or family. This made their food waste behaviors more visible to those around them and thereby increasing their motivation to conform to food waste behaviors that are approved by those around them which eventually results in the actual behavior.

Perceived Behavioral Control, Intention and Food Waste Reduction Behavior

H_8: Intention has a mediating effect on the relationship between perceived behavioral control and food waste reduction behavior.

According to the mediation analysis results, intention fully mediates the relationship between perceived behavioral control and food waste reduction behavior among young Malaysian adults in Selangor. This finding aligns with the outcomes reported by Graham-Rowe et al. (2015) which highlights the importance of intention in driving food waste reduction behavior. However, this finding differs slightly from the results of the research conducted by Mondejar-Jimenez et al. (2016), who reported a partial mediating effect of intention on the perceived behavioral control-behavior relationship.

Our result shows that when our respondents find it easy to reuse their leftover food and plan their food shopping or receive complete autonomy from their family to manage their food waste, they will first form an intention to reduce food waste before they carry out those food waste reduction behaviors. When individuals believe that they have the capability to successfully carry out a behavior or have control over executing a behavior, they are more likely to form an intention or be motivated to try to do it. Otherwise, it is very unlikely that they would continuously put in effort and persist through any challenges that come their way when attempting a particular behavior. Having the capability or the control to carry out a behavior would not necessarily directly translate into the behavior itself without having the intention first. For example, we have the skill and autonomy to create a meal out of our leftovers, but we may choose not to do it because we believe that leftover food is unhealthy which influenced our intention. As shown by our analysis, there are other factors that can significantly influence an individual's intention to reduce food waste. A study conducted by Hagger et al. (2022) found that when individuals have high perceived behavioral control over

their health behaviors, they are more likely to act according to their intention than individuals with low perceived behavioral control. So, even if they have the skills, confidence and autonomy to do it, if they do not intend to carry out the behavior, they will not.

As mentioned, there is a slight difference in our findings and findings reported by Mondejar-Jimenez et al. (2016) even though we were studying similar behaviors of the young adult's population. Mondejar-Jimenez et al. (2016) found that perceived behavioral control has a direct effect on food waste reduction behaviors while our study found none as its effect is completely mediated by intention. This discrepancy can possibly be explained by factoring in the habits of our respondents. Habit is a pattern of behavior that is relatively stable across time which is carried out automatically without much deliberate consideration. When resources and opportunities are available, habitual responses are more likely to occur. In Spain or Italy, individuals have greater exposure to environmental-friendly practices from a young age compared to Malaysians. This disparity is reflected in the higher recycling rates in Spain (43.3%) and Italy (44%) compared to Malaysia (28.1%) (EAE Business School, 2018; Kamel, 2021; Lombardi et al., 2021). Not to mention, the findings of Phooi et al. (2022), which revealed that Malaysians have a low tendency to take actions to reduce the quantity of food waste generated, can further support that food waste reduction behavior has yet to become a habitual behavior or part of the daily routine of our respondents. Thus, this can explain why high perceived behavioral control in respondents from Spain or Italy could lead directly to food waste reduction behavior, but this was not seen in respondents from Malaysia. This is because when food waste reduction behaviors are part of habits, they will not only be triggered by the presence of intention but can also be evoked by context cues. This finding suggests that by merely providing resources or opportunities to perform food waste reduction behaviors may not be adequate to promote behavioral change among young

Malaysian adults in Selangor. Rather, it is imperative to also consider factors that influence an individual's intention to cut down on food waste, such as attitude and subjective norms.

Implication

The results of the study provide some implication on the way to reduce food waste for young adults. Firstly, our current results showed that perceived behavioral control serves as the strongest predictor on the intention on food waste reduction behavior; on the other hand, intention serves as the strongest predictor on the food waste reduction behavior. In other words, intention fully mediates the relationship between perceived behavioral control and food waste reduction behavior. With this, people will get to know that the importance of being confident in their ability to manage their food can help in decreasing food waste. As our study found out that perceived behavioral control serves as the strongest predictor influencing both the intention and the food waste reduction behavior, it is important to improve the perceived behavioral control among Malaysian young adults. Some interventions can be designed with the inclusion of the provision of information on best practices for food storage, meal planning, and portion control. Additionally, hands-on training could be offered to teach young adults on how to reduce food waste effectively, and real-life experiences can be created to empower and motivate them to take practical steps towards waste reduction. This can be supported by Visschers et al. (2016), in which having knowledge on reducing food waste can enhance individuals perceived behavioral control. Other than that, acknowledging the impact of social norms on behavior is crucial in promoting food waste reduction among young adults. Since peer influence can be a strong motivator, it is important to establish food waste reduction as a social norm to encourage young adults to adopt this behavior. This can be accomplished through various approaches, including community-based programs, social media campaigns, and other initiatives that promote the notion that reducing

food waste is a positive and socially responsible behavior. By doing this, an expectation to reduce food waste will be formed in the group of Malaysian young adults and this will make them to have social pressure; thus, they will engage in food waste reduction behavior.

Additionally, our current study is also enabling the filling of literature gap as in Malaysia context. According to Jamaluddin et al. (2020), there was a lack of research that study on the food waste reduction behavior among Malaysian young adults. Hence, our research study has the potential to have contributions to the understanding of how food waste reduction behavior can be affected using the theory of planned behavior in local context. The findings are also able to serve as a reference for future researchers to investigate additional predictors that may be associated with food waste reduction behavior. Finally, the findings will also impact the government as to be encouraged to support further research on this topic and implement different interventions to promote food waste reduction practice.

Present study has examined the predicting of attitudes, subjective norms, perceived behavioral control on the intention towards food waste reduction behavior among young adults in Malaysia using the Theory of Planned Behavior. From this study, we found that perceived behavioral control acts as the most significant predictor to affect the intention to have food waste reduction behavior and also towards the food waste reduction behavior. This finding was different from other studies by Marek-Andrzejewska and Wielicka-Regulska (2021) and Barone et al. (2019) that found that attitude served as the most influencing predictor that affecting the intention on reducing food waste. On the other hand, this research also has observed that intention only fully mediates the relationship between the perceived behavioral control and the food waste reduction behavior among Malaysian young adults, while others showed a partial-mediated relationship between intention towards attitude and subjective norms, and the food waste reduction behavior. The findings of this study indicate that the proposed model is relevant and can serve as a reference for future researchers seeking

to gain greater theoretical knowledge of Malaysian young adults' food waste reduction behavior. In summary, the Theory of Planned Behavior offers a comprehensive framework for understanding and encouraging Malaysian young adults to have food waste reduction behavior

Limitations and Recommendations

Our study, like previous studies, has some limitations that should be acknowledged. First, we employed self-report measures to gather data from our participants. This technique required our participants to recall information from the past. However, as Kormos and Gifford (2014) noted, food waste behaviors are relatively inconsequential and are often performed unconsciously. Therefore, there is a possibility of inaccurate or selective recall. On top of that, given the influence of moral norms on food waste behavior, these behaviors tend to be associated with negative emotions such as shame and guilt (Talwar et al., 2022). Thus, the participants may not truthfully answer the questionnaire and may provide biased responses by exaggerating their food waste reduction behavior. However, we have carefully chosen items that are neutrally worded to avoid demonizing or praising food waste behavior. For the same reason, we have decided to study food waste reduction behavior instead of food waste behavior. On top of that, we have also assured our participants of their anonymity and the confidentiality of their data which should help alleviate any pressure to provide socially desirable responses (Larson, 2018). It should be noted that the subjective nature of our food waste reduction behavior instrument may also introduce some bias into our results. To minimize response bias and increase the accuracy of measurement, objective measures such as weight and recording food waste should be considered. However, it is important to acknowledge that such methods can be more expensive and time-consuming.

Another issue that we encountered in our study was that the instruments to measure our variables are mainly available in English. In Malaysia, aside from English, there are 3 other main languages are commonly used by Malaysians which are Malay, Chinese and Tamil. It is important for the respondents to answer questionnaires in their preferred language. This would ensure that they can better comprehend the instructions and questions which would yield a more accurate response. Therefore, we recommend that future studies to consider developing scales in the four main languages spoken in Malaysia (i.e., Malay, Chinese, Tamil and English) and validate them within the local population. In addition to that, we also suggest that future research examine the relationship between instrumental intention and food waste reduction behavior as this construct was postulated by Sheeran et al. (2005) to be a better predictor than goal intention. However, currently there is no existing instrumental intention scale for food waste reduction behavior that has been validated in Malaysia. Therefore, it would also be valuable to develop and validate a scale for this construct within the Malaysian population.

Another limitation of our study is that our sample is not highly representative of our target population. The female-to-male ratio of our participants is 63.5% to 36.5%, which differs substantially from the ratio reported by the Department of Statistics Malaysia (2021) for residents of Selangor. The female-to-male for residents in Selangor in year 2020 is 51.4% to 48.6%. Besides that, the ethnic composition of our sample is also significantly different from that of the state, with our participants being mostly Chinese whereas Malay is the predominant ethnic group in Selangor according to MyCensus 2020 (Department of Statistics Malaysia, 2020). Thus, our results may not be generalizable. We were unable to conduct a random sampling method due to the absence of a sampling frame. We opted to collect data physically and conveniently from students in a university in Selangor besides distributing the survey online. This method of collecting data has resulted in a non-representative sample in

terms of gender and ethnicity. To improve upon these limitations, we recommend that future studies employ alternative data collection strategies such as paper surveys that have been shown to yield higher response rates compared to online surveys (Ebert et al., 2018). Collecting data from a variety of locations, including urban and rural areas, would further enhance the representativeness of the sample.

Lastly, in order to design an effective intervention to facilitate a change in food waste behavior among the public, it is important to have a model with high predictive effect. It is worth noting that the use of the Theory of Planned Behavior (TPB) in predicting behavior has faced several criticisms. TPB has been criticized for being inadequate in explaining behavior (Sniehotta et al., 2012). It assumes that behaviors are formed through rational reasoning and ignores many other relevant factors like affects and habits. Several past studies that incorporated other factors into their proposed extended theory of planned behavior have yielded a model with better predictive effect (Fraj-Andrés et al., 2022; Soorani & Ahmadvand, 2019).

To address this issue, future research should incorporate constructs from other theories such as the Theory of Interpersonal Behavior (TIB), the Norm Activation Model (NAM), the value-belief-norm theory and others to develop a more comprehensive predictive model for food waste reduction behavior (Fraj-Andrés et al., 2022; Mumtaz et al., 2022). Moreover, investigating conflicting attitudes, such as those related to health and financial concerns, in the context of food waste reduction behavior could be insightful. This approach would enable us to assess the relative weightage of influence of different attitudes towards food waste reduction behavior. Since SPSS alone is unable to carry out a structural equation modelling with partial least squares estimation, this analysis is suggested to be carried out using software such as AMOS, SmartPLS or WarpPLS.

Conclusion

This research study aims to utilize the Theory of Planned Behavior model to investigate the attitude, subjective norm, perceived behavioral control food waste reduction behavior, with intention as the mediator among young adults living in Selangor of Malaysia. The results indicated that attitude and subjective norm significantly predict the intention on food waste reduction behavior. While perceived behavioral control serves as the strongest predictor to the intention to reduce food waste. Moreover, perceived behavioral control is also able to predict food waste reduction behavior. On the other hand, intention is found to be the strongest predictor to food waste reduction behavior based on our study. According to the mediation model, only intention fully mediates the relationship between perceived behavioral control and food waste reduction behavior. On the other hand, intention shows a partial mediating effect on attitude and subjective norm towards food waste reduction behavior. With this, the findings of this study can be used for young adults to explore the possible factors that influence their food waste reduction behavior. Hence, suitable and effective ways to reduce food waste can be implemented to keep the environment sustained.

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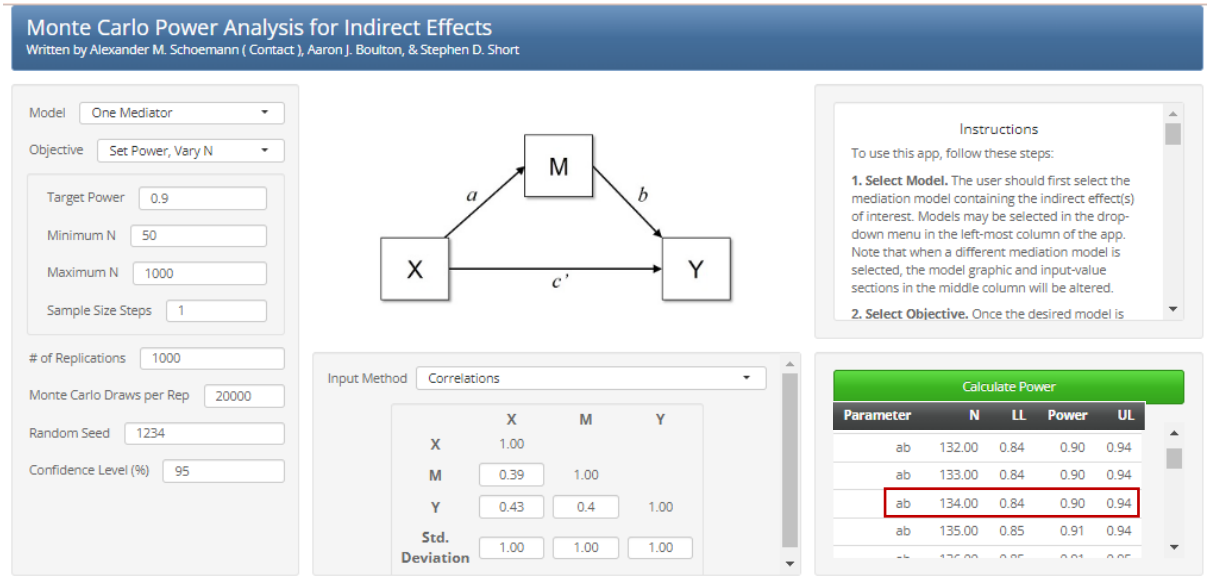
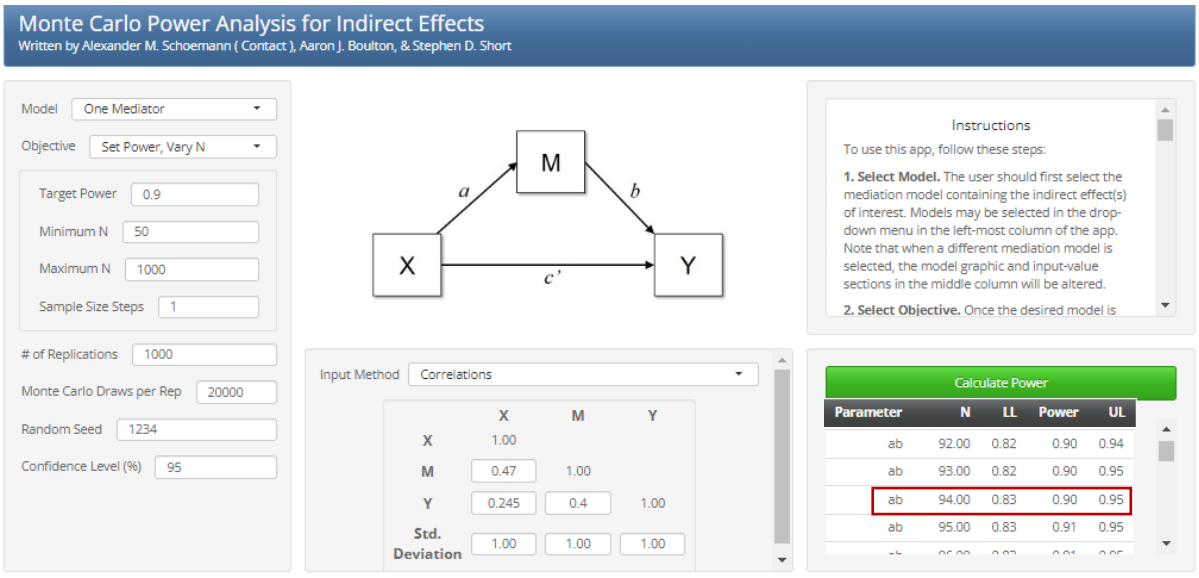
Appendices

Appendix A: Sample Size Calculation

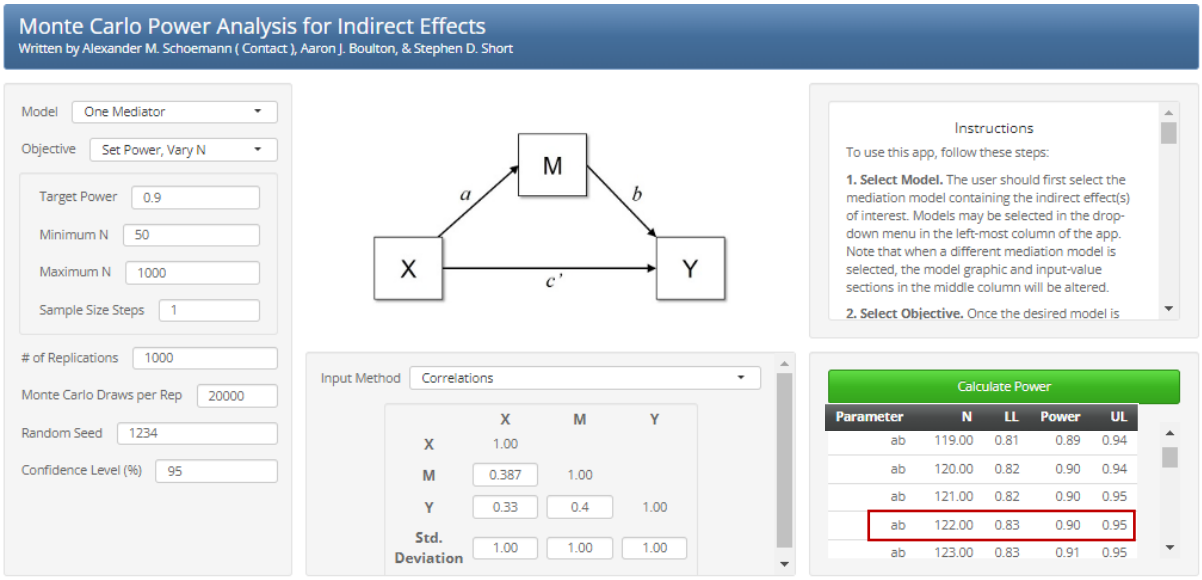
Appendix A1: Sample Size Calculation with Perceived Behavioral Control (X) as the Independent Variable



Appendix A2: Sample Size Calculation with Attitude (X) as the Independent Variable



Appendix A3: Sample Size Calculation with Subjective Norm (X) as the Independent Variable



Appendix A4: Correlation of Attitude (X_1) and Intention (M_1)

Determinants of consumer food waste behaviour: Two routes to food waste (Stancu et al., 2016). $r=0.51$, $p<0.01$

Table 3. Correlations and descriptives between food waste and psychological and household food-related constructs (N=1037[a])

	Food waste behaviour[b]	Intention not to waste food[c]	Shopping routines[c]	Leftovers reuse routines[c]	Planning routines[c]	Household skills[c]	Attitudes towards food waste[c]	Moral norms[c]	Perceived behavioural control[c]	Injunctive norms[c]
Food waste behaviour	1									
Intention not to waste food	-.40**	1								
Shopping routines	.27**	-.08**	1							
Leftovers reuse routines	-.40**	.44**	-.12**	1						
Planning routines	-.18**	.17**	-.27**	.21**	1					
Household skills	-.41**	.37**	-.23**	.40**	.46**	1				
Attitudes towards food waste	-.27**	.51**	-.02	.31**	.10**	.18**	1			
Moral norms	-.10**	.37**	.03	.21**	.11**	.13**	.56**	1		
Perceived behavioural control	-.44**	.35**	-.15**	.34**	.10**	.28**	.41**	.25**	1	
Injunctive norms	-.33**	.49**	-.02	.40**	.11**	.24**	.49**	.39**	.37**	1
Mean	**1.7**	**5.9**	**3.7**	**5.3**	**4.0**	**5.3**	**5.4**	**4.0**	**4.8**	**5.5**
Standard deviation	.6	1.4	1.5	1.1	1.7	1.2	1.3	1.8	1.5	1.3

**p<.01

[a] due to exclusion of multivariate outliers; [b] rated on a 5-point rating scale; [c] rated on a 7-point rating scale

Avoiding food waste by Romanian consumers: The importance of planning and shopping routines (Stefan et al., 2013). r=-0.54, p<0.001

Table 4
Matrix of correlations (n = 244).

	1	2	3	4	5	6	7	8
1. Food waste	–							
2. Intention not to waste food	−.27*	–						
3. Planning routines	−.47***	.24*	–					
4. Shopping routines	.73***	−.24*	−.29**	–				
5. Moral attitudes	−.27**	.76***	.32**	−.34***	–			
6. Lack of concern	.22**	−.54***	−.13	.12	−.41***	–		
7. Subjective norms	.14	.25**	−.08	.14	.26***	−.32***	–	
8. PBC	−.62***	.18	.33***	−.66***	.24**	−.14*	−.18**	–

* p < .05.
** p < .01.
*** p < .001.

Bringing habits and emotions into food waste behaviour (Russell et al., 2017). r=0.36, p<0.01

Table 1
Means, Standard Deviations, Time, and Bivariate Correlations.[a]

	Mean	SD	Time Measured	1	2	3	4	5	6	7	8
Attitude	4.26	0.60	Time 1	.76							
Subjective Norms	4.02	0.76	Time 1	.56**	.72						
Perceived Behavioural Control	4.15	0.64	Time 1	.30**	.33**	.59					
Habitual food waste behaviour	3.52	1.81	Time 1	−0.10	0.03	−.21**	–				
Positive Emotion	0.20	0.56	Time 2	−0.02	0.01	0.04	−0.07	–			
Negative Emotion	0.80	0.81	Time 2	.10	0.05	−0.06	.18*	−.32**	–		
Intention	3.58	0.84	Time 3	.36**	.42**	.43**	0.02	−0.01	.19*	–	
Food waste behaviour	3.08	1.49	Time 4	−.17*	−0.05	−.23**	.71**	−.15*	.29**	−0.06	–

[a] Cronbach's alpha for computed scales are on the diagonal. Asterisks indicate the following: * = p < 0.05, ** = p < 0.01.

Average correlation of Attitude (X_1) and Intention (M_1)

= (0.51+|-0.54|+0.36)/3

= 0.470

Appendix A5: Correlation of Attitude (X_1) and Behavior (Y_1)

Determinants of consumer food waste behaviour: Two routes to food waste (Stancu et al., 2016). r=-0.27, p<0.01

Table 3. Correlations and descriptives between food waste and psychological and household food-related constructs (N=1037[a])

	Food waste behaviour[b]	Intention not to waste food[c]	Shopping routines[c]	Leftovers reuse routines[c]	Planning routines[c]	Household skills[c]	Attitudes towards food waste[c]	Moral norms[c]	Perceived behavioural control[c]	Injunctive norms[c]
Food waste behaviour	1									
Intention not to waste food	-.40**	1								
Shopping routines	.27**	-.08**	1							
Leftovers reuse routines	-.40**	.44**	-.12**	1						
Planning routines	-.18**	.17**	-.27**	.21**	1					
Household skills	-.41**	.37**	-.23**	.40**	.46**	1				
Attitudes towards food waste	-.27**	.51**	-.02	.31**	.10**	.18**	1			
Moral norms	-.10**	.37**	.03	.21**	.11**	.13**	.56**	1		
Perceived behavioural control	-.44**	.35**	-.15**	.34**	.10**	.28**	.41**	.25**	1	
Injunctive norms	-.33**	.49**	-.02	.40**	.11**	.24**	.49**	.39**	.37**	1
Mean	**1.7**	**5.9**	**3.7**	**5.3**	**4.0**	**5.3**	**5.4**	**4.0**	**4.8**	**5.5**
Standard deviation	.6	1.4	1.5	1.1	1.7	1.2	1.3	1.8	1.5	1.3

**p<.01

[a] due to exclusion of multivariate outliers; [b] rated on a 5-point rating scale; [c] rated on a 7-point rating scale

Avoiding food waste by Romanian consumers: The importance of planning and shopping routines (Stefan et al., 2013). r=0.22, p<0.01

Table 4
Matrix of correlations ($n = 244$).

	1	2	3	4	5	6	7	8
1. Food waste	–							
2. Intention not to waste food	−.27*	–						
3. Planning routines	−.47***	.24*	–					
4. Shopping routines	.73***	−.24*	−.29**	–				
5. Moral attitudes	−.27**	.76***	.32**	−.34***	–			
6. Lack of concern	.22**	−.54***	−.13	.12	−.41***	–		
7. Subjective norms	.14	.25**	−.08	.14	.26***	−.32***	–	
8. PBC	−.62***	.18	.33***	−.66***	.24**	−.14*	−.18**	–

* $p < .05$.
** $p < .01$.
*** $p < .001$.

Average correlation of Attitude (X_1) and Behavior (Y_1)

= (|-0.27|+0.22)/2

= 0.245

Appendix A6: Correlation of Subjective Norm (X_2) and Intention (M_2)

Determinants of consumer food waste behaviour: Two routes to food waste (Stancu et al., 2016). r=0.49, p<0.01

Table 3. Correlations and descriptives between food waste and psychological and household food-related constructs (N=1037[a])

	Food waste behaviour[b]	Intention not to waste food[c]	Shopping routines[c]	Leftovers reuse routines[c]	Planning routines[c]	Household skills[c]	Attitudes towards food waste[c]	Moral norms[c]	Perceived behavioural control[c]	Injunctive norms[c]
Food waste behaviour	1									
Intention not to waste food	-.40**	1								
Shopping routines	.27**	-.08**	1							
Leftovers reuse routines	-.40**	.44**	-.12**	1						
Planning routines	-.18**	.17**	-.27**	.21**	1					
Household skills	-.41**	.37**	-.23**	.40**	.46**	1				
Attitudes towards food waste	-.27**	.51**	-.02	.31**	.10**	.18**	1			
Moral norms	-.10**	.37**	.03	.21**	.11**	.13**	.56**	1		
Perceived behavioural control	-.44**	.35**	-.15**	.34**	.10**	.28**	.41**	.25**	1	
Injunctive norms	-.33**	.49**	-.02	.40**	.11**	.24**	.49**	.39**	.37**	1
Mean	**1.7**	**5.9**	**3.7**	**5.3**	**4.0**	**5.3**	**5.4**	**4.0**	**4.8**	**5.5**
Standard deviation	.6	1.4	1.5	1.1	1.7	1.2	1.3	1.8	1.5	1.3

**p<.01
[a] due to exclusion of multivariate outliers; [b] rated on a 5-point rating scale; [c] rated on a 7-point rating scale

Avoiding food waste by Romanian consumers: The importance of planning

and shopping routines (Stefan et al., 2013). r=0.25, p<0.01

Table 4
Matrix of correlations (n = 244).

	1	2	3	4	5	6	7	8
1. Food waste	–							
2. Intention not to waste food	−.27*	–						
3. Planning routines	−.47***	.24*	–					
4. Shopping routines	.73***	−.24*	−.29**	–				
5. Moral attitudes	−.27**	.76***	.32**	−.34***	–			
6. Lack of concern	.22**	−.54***	−.13	.12	−.41***	–		
7. Subjective norms	.14	.25**	−.08	.14	.26***	−.32***	–	
8. PBC	−.62***	.18	.33***	−.66***	.24**	−.14*	−.18**	–

* p < .05.
** p < .01.
*** p < .001.

Bringing habits and emotions into food waste behaviour (Russell et al., 2017). r=0.42, p<0.01

Table 1
Means, Standard Deviations, Time, and Bivariate Correlations.[a]

	Mean	SD	Time Measured	1	2	3	4	5	6	7	8
Attitude	4.26	0.60	Time 1	.76							
Subjective Norms	4.02	0.76	Time 1	.56**	.72						
Perceived Behavioural Control	4.15	0.64	Time 1	.30**	.33**	.59					
Habitual food waste behaviour	3.52	1.81	Time 1	−0.10	0.03	−.21**	–				
Positive Emotion	0.20	0.56	Time 2	−0.02	0.01	0.04	−0.07	–			
Negative Emotion	0.80	0.81	Time 2	.10	0.05	−0.06	.18*	−.32**	–		
Intention	3.58	0.84	Time 3	.36**	.42**	.43**	0.02	−0.01	.19*	–	
Food waste behaviour	3.08	1.49	Time 4	−.17*	−0.05	−.23**	.71**	−.15*	.29**	−0.06	–

[a] Cronbach's alpha for computed scales are on the diagonal. Asterisks indicate the following: * = p < 0.05, ** = p < 0.01.

Average correlation of Subjective Norm (X_2) and Intention (M_2)

= (0.49+0.25+0.42)/3

= 0.387

Appendix A7: Correlation of Subjective Norm (X_2) and Behavior (Y_2)

Determinants of consumer food waste behaviour: Two routes to food waste (Stancu et al., 2016). r=-0.33, p<0.01

Table 3. Correlations and descriptives between food waste and psychological and household food-related constructs (N=1037[a])

	Food waste behaviour[b]	Intention not to waste food[c]	Shopping routines[c]	Leftovers reuse routines[c]	Planning routines[c]	Household skills[c]	Attitudes towards food waste[c]	Moral norms[c]	Perceived behavioural control[c]	Injunctive norms[c]
Food waste behaviour	1									
Intention not to waste food	-.40**	1								
Shopping routines	.27**	-.08**	1							
Leftovers reuse routines	-.40**	.44**	-.12**	1						
Planning routines	-.18**	.17**	-.27**	.21**	1					
Household skills	-.41**	.37**	-.23**	.40**	.46**	1				
Attitudes towards food waste	-.27**	.51**	-.02	.31**	.10**	.18**	1			
Moral norms	-.10**	.37**	.03	.21**	.11**	.13**	.56**	1		
Perceived behavioural control	-.44**	.35**	-.15**	.34**	.10**	.28**	.41**	.25**	1	
Injunctive norms	-.33**	.49**	-.02	.40**	.11**	.24**	.49**	.39**	.37**	1
Mean	**1.7**	**5.9**	**3.7**	**5.3**	**4.0**	**5.3**	**5.4**	**4.0**	**4.8**	**5.5**
Standard deviation	.6	1.4	1.5	1.1	1.7	1.2	1.3	1.8	1.5	1.3

**p<.01

[a] due to exclusion of multivariate outliers; [b] rated on a 5-point rating scale; [c] rated on a 7-point rating scale

Appendix A8: Correlation of Perceived Behavioral Control (X_3) and Intention (M_3)

Determinants of consumer food waste behaviour: Two routes to food waste (Stancu et al., 2016). $r=0.35$, $p<0.01$

Table 3. Correlations and descriptives between food waste and psychological and household food-related constructs (N=1037[a])

	Food waste behaviour[b]	Intention not to waste food[c]	Shopping routines[c]	Leftovers reuse routines[c]	Planning routines[c]	Household skills[c]	Attitudes towards food waste[c]	Moral norms[c]	Perceived behavioural control[c]	Injunctive norms[c]
Food waste behaviour	1									
Intention not to waste food	-.40**	1								
Shopping routines	.27**	-.08**	1							
Leftovers reuse routines	-.40**	.44**	-.12**	1						
Planning routines	-.18**	.17**	-.27**	.21**	1					
Household skills	-.41**	.37**	-.23**	.40**	.46**	1				
Attitudes towards food waste	-.27**	.51**	-.02	.31**	.10**	.18**	1			
Moral norms	-.10**	.37**	.03	.21**	.11**	.13**	.56**	1		
Perceived behavioural control	-.44**	.35**	-.15**	.34**	.10**	.28**	.41**	.25**	1	
Injunctive norms	-.33**	.49**	-.02	.40**	.11**	.24**	.49**	.39**	.37**	1
Mean	**1.7**	**5.9**	**3.7**	**5.3**	**4.0**	**5.3**	**5.4**	**4.0**	**4.8**	**5.5**
Standard deviation	.6	1.4	1.5	1.1	1.7	1.2	1.3	1.8	1.5	1.3

**p<.01

[a] due to exclusion of multivariate outliers; [b] rated on a 5-point rating scale; [c] rated on a 7-point rating scale

Bringing habits and emotions into food waste behaviour (Russell et al., 2017). r=0.43, p<0.01

Table 1
Means, Standard Deviations, Time, and Bivariate Correlations.[a]

	Mean	SD	Time Measured	1	2	3	4	5	6	7	8
Attitude	4.26	0.60	Time 1	.76							
Subjective Norms	4.02	0.76	Time 1	.56**	.72						
Perceived Behavioural Control	4.15	0.64	Time 1	.30**	.33**	.59					
Habitual food waste behaviour	3.52	1.81	Time 1	−0.10	0.03	−.21**	–				
Positive Emotion	0.20	0.56	Time 2	−0.02	0.01	0.04	−0.07	–			
Negative Emotion	0.80	0.81	Time 2	.10	0.05	−0.06	.18*	−.32**	–		
Intention	3.58	0.84	Time 3	.36**	.42**	.43**	0.02	−0.01	.19*	–	
Food waste behaviour	3.08	1.49	Time 4	−.17*	−0.05	−.23**	.71**	−.15*	.29**	−0.06	–

[a] Cronbach's alpha for computed scales are on the diagonal. Asterisks indicate the following: * = $p < 0.05$, ** = $p < 0.01$.

Average correlation of Perceived Behavioral Control (X_3) and Intention (M_2)

= (0.35+0.43)/2

= 0.39

Appendix A9: Correlation of Perceived Behavioral Control (X_3) and Behavior (Y_3)

Determinants of consumer food waste behaviour: Two routes to food waste (Stancu et al., 2016). r=-0.44, p<0.01

Table 3. Correlations and descriptives between food waste and psychological and household food-related constructs (N=1037[a])

	Food waste behaviour[b]	Intention not to waste food[c]	Shopping routines[c]	Leftovers reuse routines[c]	Planning routines[c]	Household skills[c]	Attitudes towards food waste[c]	Moral norms[c]	Perceived behavioural control[c]	Injunctive norms[c]
Food waste behaviour	1									
Intention not to waste food	-.40**	1								
Shopping routines	.27**	-.08**	1							
Leftovers reuse routines	-.40**	.44**	-.12**	1						
Planning routines	-.18**	.17**	-.27**	.21**	1					
Household skills	-.41**	.37**	-.23**	.40**	.46**	1				
Attitudes towards food waste	-.27**	.51**	-.02	.31**	.10**	.18**	1			
Moral norms	-.10**	.37**	.03	.21**	.11**	.13**	.56**	1		
Perceived behavioural control	-.44**	.35**	-.15**	.34**	.10**	.28**	.41**	.25**	1	
Injunctive norms	-.33**	.49**	-.02	.40**	.11**	.24**	.49**	.39**	.37**	1
Mean	**1.7**	**5.9**	**3.7**	**5.3**	**4.0**	**5.3**	**5.4**	**4.0**	**4.8**	**5.5**
Standard deviation	.6	1.4	1.5	1.1	1.7	1.2	1.3	1.8	1.5	1.3

**p<.01

[a] due to exclusion of multivariate outliers; [b] rated on a 5-point rating scale; [c] rated on a 7-point rating scale

Avoiding food waste by Romanian consumers: The importance of planning and shopping routines (Stefan et al., 2013). r=-0.62, p<0.001

Table 4
Matrix of correlations (n = 244).

	1	2	3	4	5	6	7	8
1. Food waste	–							
2. Intention not to waste food	−.27*	–						
3. Planning routines	−.47***	.24*	–					
4. Shopping routines	.73***	−.24*	−.29**	–				
5. Moral attitudes	−.27**	.76***	.32**	−.34***	–			
6. Lack of concern	.22**	−.54***	−.13	.12	−.41***	–		
7. Subjective norms	.14	.25**	−.08	.14	.26***	−.32***	–	
8. PBC	−.62***	.18	.33***	−.66***	.24**	−.14*	−.18**	–

* p < .05.
** p < .01.
*** p < .001.

Bringing habits and emotions into food waste behaviour (Russell et al., 2017). r=-0.23, p<0.01

Table 1
Means, Standard Deviations, Time, and Bivariate Correlations.[a]

	Mean	SD	Time Measured	1	2	3	4	5	6	7	8
Attitude	4.26	0.60	Time 1	.76							
Subjective Norms	4.02	0.76	Time 1	.56**	.72						
Perceived Behavioural Control	4.15	0.64	Time 1	.30**	.33**	.59					
Habitual food waste behaviour	3.52	1.81	Time 1	−0.10	0.03	−.21**	–				
Positive Emotion	0.20	0.56	Time 2	−0.02	0.01	0.04	−0.07	–			
Negative Emotion	0.80	0.81	Time 2	.10	0.05	−0.06	.18*	−.32**	–		
Intention	3.58	0.84	Time 3	.36**	.42**	.43**	0.02	−0.01	.19*	–	
Food waste behaviour	3.08	1.49	Time 4	−.17*	−0.05	−.23**	.71**	−.15*	.29**	−0.06	–

[a] Cronbach's alpha for computed scales are on the diagonal. Asterisks indicate the following: * = p < 0.05, ** = p < 0.01.

Average correlation of Perceived Behavioral Control (X_3) and Behavior (Y_3)

= (|-0.44|+|-0.62|+|-0.23|)/3

= 0.43

Appendix A10: Correlation of Intention (M) and Behavior (Y)

Determinants of consumer food waste behaviour: Two routes to food waste (Stancu et al., 2016). r=-0.40, p<0.01

Table 3. Correlations and descriptives between food waste and psychological and household food-related constructs (N=1037[a])

	Food waste behaviour[b]	Intention not to waste food[c]	Shopping routines[c]	Leftovers reuse routines[c]	Planning routines[c]	Household skills[c]	Attitudes towards food waste[c]	Moral norms[c]	Perceived behavioural control[c]	Injunctive norms[c]
Food waste behaviour	1									
Intention not to waste food	-.40**	1								
Shopping routines	.27**	-.08**	1							
Leftovers reuse routines	-.40**	.44**	-.12**	1						
Planning routines	-.18**	.17**	-.27**	.21**	1					
Household skills	-.41**	.37**	-.23**	.40**	.46**	1				
Attitudes towards food waste	-.27**	.51**	-.02	.31**	.10**	.18**	1			
Moral norms	-.10**	.37**	.03	.21**	.11**	.13**	.56**	1		
Perceived behavioural control	-.44**	.35**	-.15**	.34**	.10**	.28**	.41**	.25**	1	
Injunctive norms	-.33**	.49**	-.02	.40**	.11**	.24**	.49**	.39**	.37**	1
Mean	**1.7**	**5.9**	**3.7**	**5.3**	**4.0**	**5.3**	**5.4**	**4.0**	**4.8**	**5.5**
Standard deviation	.6	1.4	1.5	1.1	1.7	1.2	1.3	1.8	1.5	1.3

**p<.01

[a] due to exclusion of multivariate outliers; [b] rated on a 5-point rating scale; [c] rated on a 7-point rating scale

Appendix B: Reliability Test for Pilot Test

Appendix B1: Attitude Reliability

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.722	.726	5

Appendix B2: Subjective Norm Reliability

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.648	.645	5

Appendix B3: Perceived Behavioral Control Reliability

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.766	.766	5

Appendix B4: Intention Reliability

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.817	.830	5

Appendix B5: Food Waste Reduction Behavior Reliability

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.821	.836	6

Appendix C: Reliability Test for Actual Test

Scale: Attitude Reliability

Case Processing Summary

		N	%
Cases	Valid	167	100.0
	Excluded[a]	0	.0
	Total	167	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.755	.756	5

Scale: SN Reliability

Case Processing Summary

		N	%
Cases	Valid	167	100.0
	Excluded[a]	0	.0
	Total	167	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.758	.760	5

Scale: PBC1 Reliability

Case Processing Summary

		N	%
Cases	Valid	167	100.0
	Excluded[a]	0	.0
	Total	167	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.571	.570	5

Scale: Intention Reliability

Case Processing Summary

		N	%
Cases	Valid	167	100.0
	Excluded[a]	0	.0
	Total	167	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.711	.726	5

Scale: FWRB Reliability

Case Processing Summary

		N	%
Cases	Valid	167	100.0
	Excluded[a]	0	.0
	Total	167	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.873	.876	6

Appendix D: Normality Testing

Appendix D1: Histogram

Figure D1.1: Histogram for the variable “Attitude”

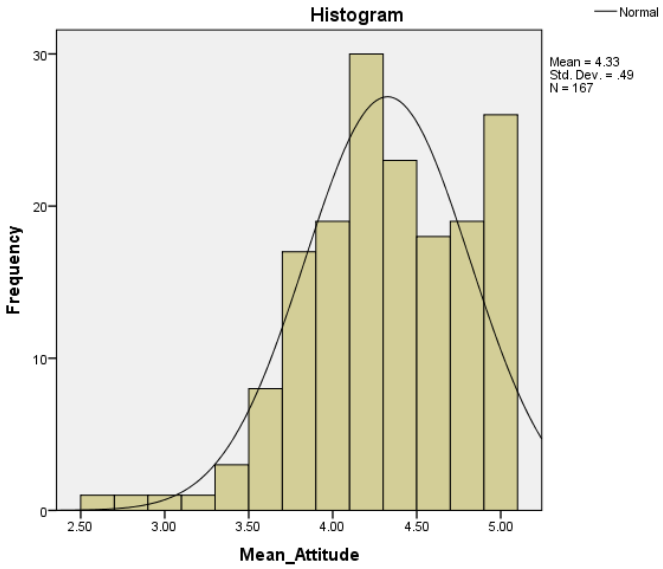


Figure D1.2: Histogram for the variable “Subjective Norm”

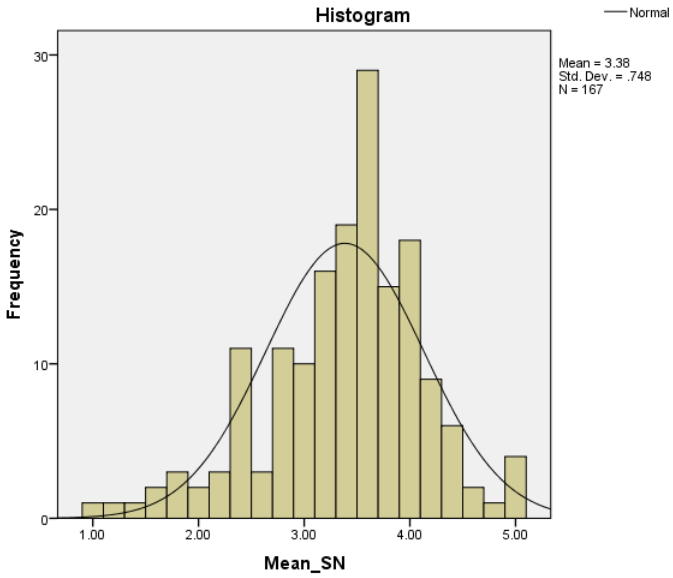


Figure D1.3: Histogram for the variable “Perceived Behavioral Control”

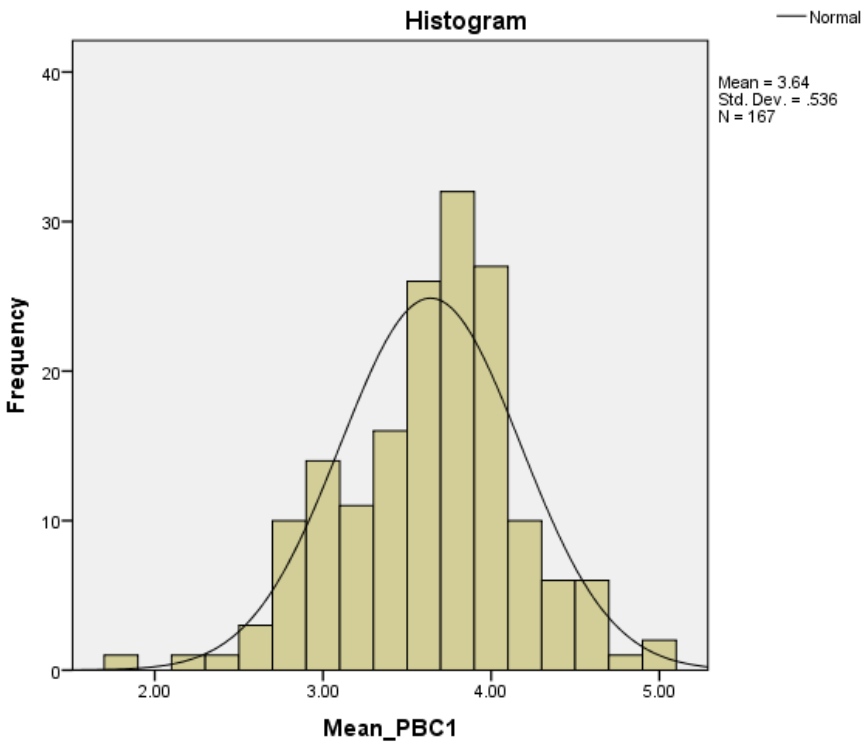


Figure D1.3: Histogram for the variable “Intention”

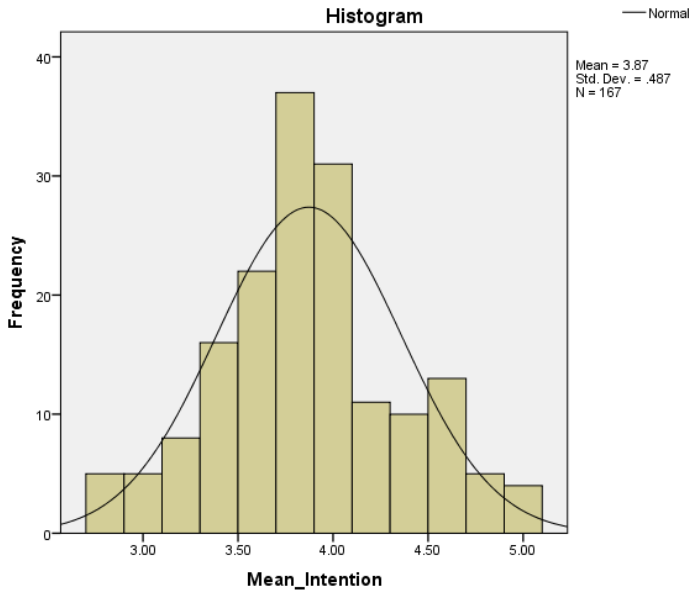
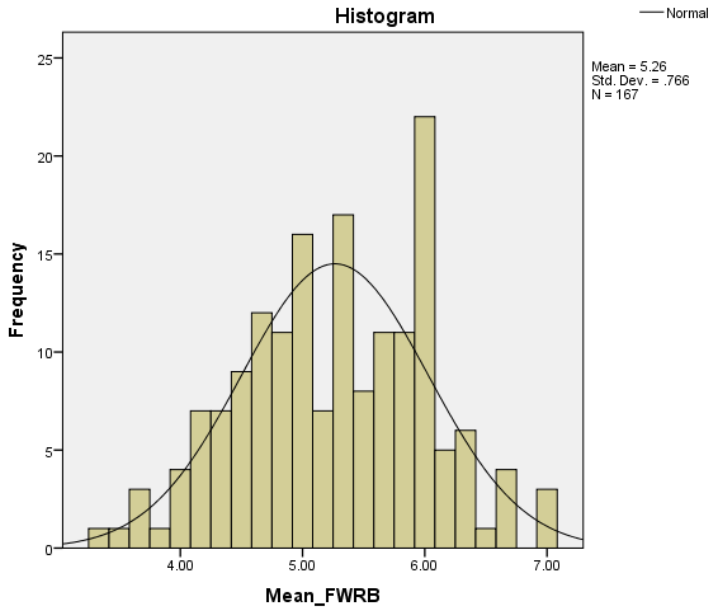


Figure D1.3: Histogram for the variable “Food Waste Reduction Behavior”


Histogram
Normal
Mean = 5.26
Std. Dev. = .766
N = 167
Frequency
25
20
15
10
5
0
4.00
5.00
6.00
7.00
Mean_FWRB

Appendix D2: Q-Q Plot

Figure D2.1: Q-Q Plot for the variable “Attention”.

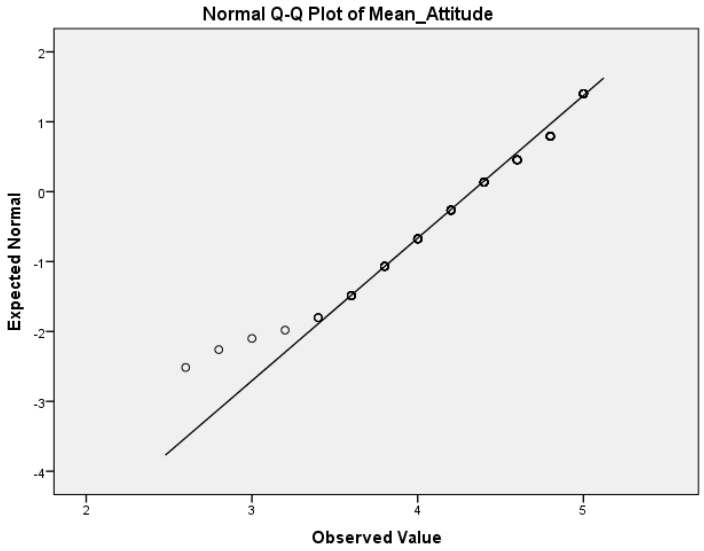


Figure D2.2: Q-Q Plot for the variable “Subjective Norm”

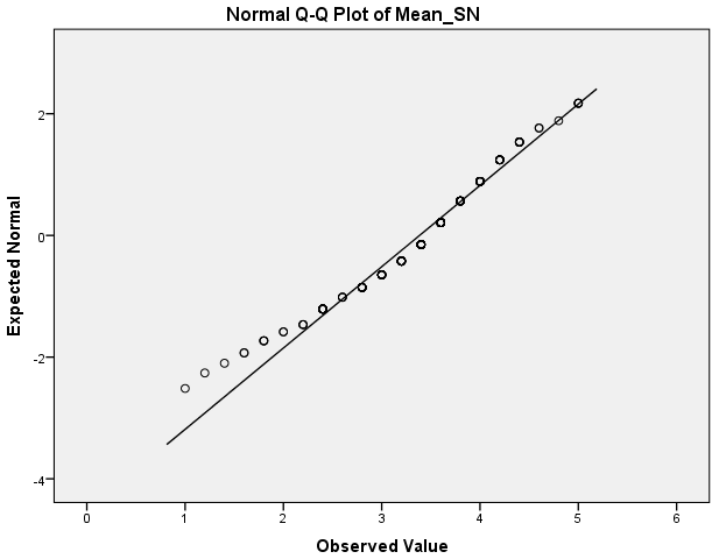
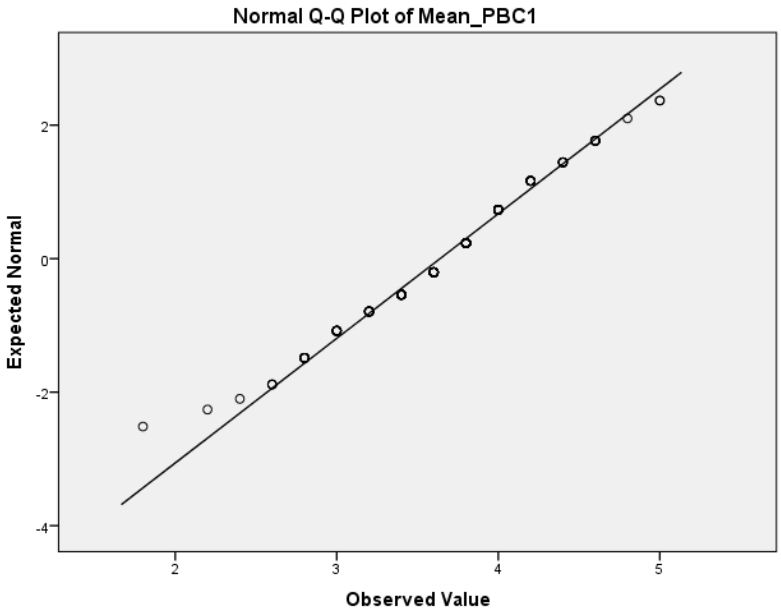


Figure D2.3: Q-Q Plot for the variable “Perceived Behavioral Control”.



Note. PBC1 = Perceived Behavioral Control Scale.

Figure D2.4: Q-Q Plot for the variable “Perceived Behavioral Control”.

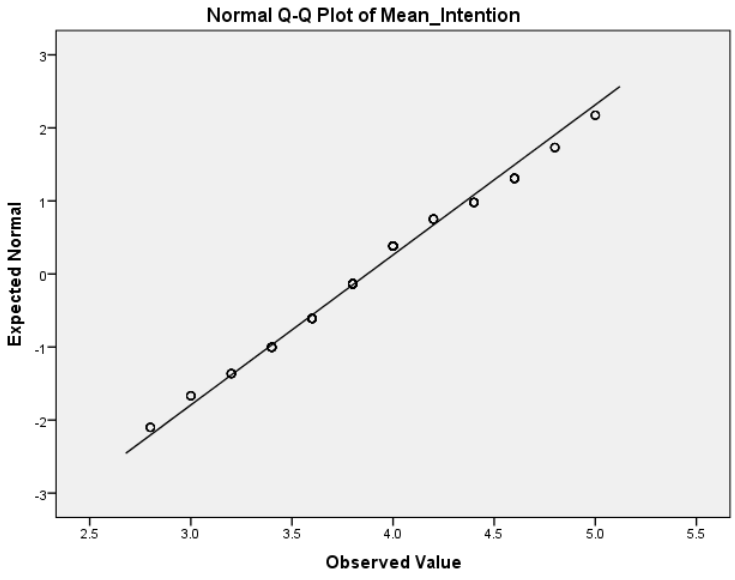
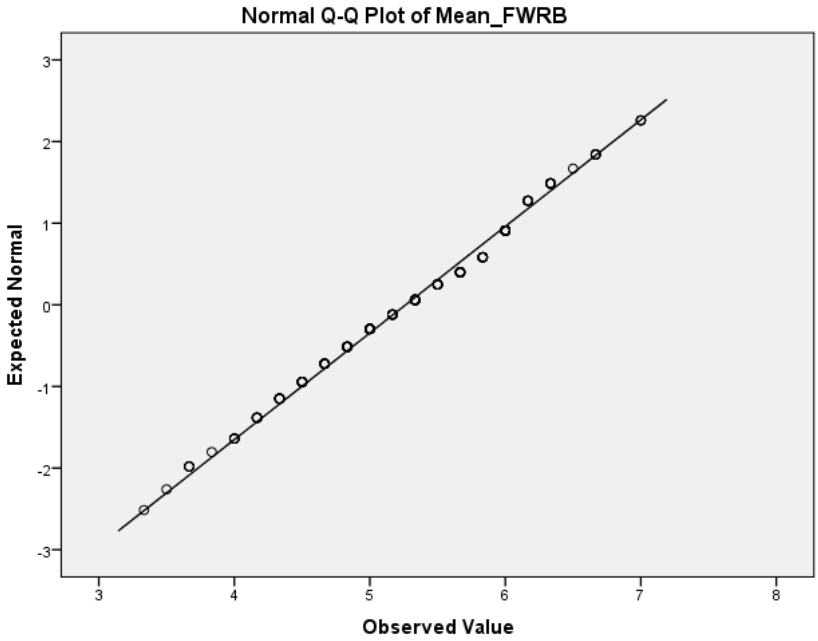


Figure D2.5: Q-Q Plot for the variable “Food Waste Reduction Behavior”



Appendix D3: Skewness and Kurtosis

Appendix D3.1: Skewness and Kurtosis of Attitude, Subjective Norm, Perceived Behavioral Control, Intention, and Food Waste Reduction Behavior

Descriptives

			Statistic	Std. Error
Mean_Attitude	Mean		4.3257	.03793
	95% Confidence Interval for Mean	Lower Bound	4.2509	
		Upper Bound	4.4006	
	5% Trimmed Mean		4.3512	
	Median		4.4000	
	Variance		.240	
	Std. Deviation		.49014	
	Minimum		2.60	
	Maximum		5.00	
	Range		2.40	
	Interquartile Range		.80	
	Skewness		-.554	.188
	Kurtosis		.339	.374
Mean_SN	Mean		3.3844	.05791
	95% Confidence Interval for Mean	Lower Bound	3.2701	
		Upper Bound	3.4988	
	5% Trimmed Mean		3.4089	
	Median		3.6000	
	Variance		.560	
	Std. Deviation		.74833	
	Minimum		1.00	
	Maximum		5.00	
	Range		4.00	
	Interquartile Range		.80	
	Skewness		-.584	.188
	Kurtosis		.632	.374
Mean_PBC1	Mean		3.6395	.04145
	95% Confidence Interval for Mean	Lower Bound	3.5577	
		Upper Bound	3.7213	
	5% Trimmed Mean		3.6434	

	Median		3.8000	
	Variance		.287	
	Std. Deviation		.53560	
	Minimum		1.80	
	Maximum		5.00	
	Range		3.20	
	Interquartile Range		.60	
	Skewness		-.298	.188
	Kurtosis		.484	.374
Mean_Intention	Mean		3.8731	.03766
	95% Confidence Interval for Mean	Lower Bound	3.7987	
		Upper Bound	3.9474	
	5% Trimmed Mean		3.8714	
	Median		3.8000	
	Variance		.237	
	Std. Deviation		.48662	
	Minimum		2.80	
	Maximum		5.00	
	Range		2.20	
	Interquartile Range		.60	
	Skewness		.133	.188
	Kurtosis		-.072	.374
Mean_FWRB	Mean		5.2645	.05926
	95% Confidence Interval for Mean	Lower Bound	5.1475	
		Upper Bound	5.3815	
	5% Trimmed Mean		5.2676	
	Median		5.3333	
	Variance		.586	
	Std. Deviation		.76579	
	Minimum		3.33	
	Maximum		7.00	
	Range		3.67	
	Interquartile Range		1.17	
	Skewness		-.101	.188
	Kurtosis		-.474	.374

Appendix E: Hypothesis Testing Results

Appendix E1: Linear Regression Analyses

Appendix E1.1: Linear Regression Model Summary of Attitude and Intention

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.392[a]	.153	.148	.44911	.153	29.892	1	165	.000	1.915

a. Predictors: (Constant), Mean_Attitude

b. Dependent Variable: Mean_Intention

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.029	1	6.029	29.892	.000[b]
	Residual	33.280	165	.202		
	Total	39.309	166			

a. Dependent Variable: Mean_Intention

b. Predictors: (Constant), Mean_Attitude

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	2.191	.310		7.077	.000	1.580	2.802		
	Mean_Attitude	.389	.071	.392	5.467	.000	.248	.529	1.000	1.000

a. Dependent Variable: Mean_Intention

Appendix E1.2: Linear Regression Model Summary of Subjective Norm and Intention

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.203[a]	.041	.035	.47793	.041	7.090	1	165	.009	1.928

a. Predictors: (Constant), Mean_SN

b. Dependent Variable: Mean_Intention

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.620	1	1.620	7.090	.009[b]
	Residual	37.689	165	.228		
	Total	39.309	166			

a. Dependent Variable: Mean_Intention

b. Predictors: (Constant), Mean_SN

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	3.426	.172		19.944	.000	3.087	3.766		
	Mean_SN	.132	.050	.203	2.663	.009	.034	.230	1.000	1.000

Appendix E1.3: Linear Regression Model Summary of Perceived Behavioral Norm and Intention

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.572[a]	.327	.323	.40028	.327	80.338	1	165	.000	1.900

a. Predictors: (Constant), Mean_PBC1

b. Dependent Variable: Mean_Intention

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.872	1	12.872	80.338	.000[b]
	Residual	26.437	165	.160		
	Total	39.309	166			

a. Dependent Variable: Mean_Intention

b. Predictors: (Constant), Mean_PBC1

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	1.981	.213		9.283	.000	1.560	2.402		
	Mean_PBC1	.520	.058	.572	8.963	.000	.405	.634	1.000	1.000

a. Dependent Variable: Mean_Intention

Appendix E1.4: Linear Regression Model Summary of Perceived Behavioral Norm and Food Waste Reduction Behavior

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.360[a]	.130	.124	.71656	.130	24.592	1	165	.000	2.119

a. Predictors: (Constant), Mean_PBC1

b. Dependent Variable: Mean_FWRB

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.627	1	12.627	24.592	.000[b]
	Residual	84.720	165	.513		
	Total	97.347	166			

a. Dependent Variable: Mean_FWRB

b. Predictors: (Constant), Mean_PBC1

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	3.390	.382		8.876	.000	2.636	4.145		
	Mean_PBC1	.515	.104	.360	4.959	.000	.310	.720	1.000	1.000

a. Dependent Variable: Mean_FWRB

Appendix E1.4: Linear Regression Model Summary of Intention and Food Waste Reduction Behavior

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.536[a]	.288	.283	.64831	.288	66.607	1	165	.000	2.107

a. Predictors: (Constant), Mean_Intention

b. Dependent Variable: Mean_FWRB

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	27.996	1	27.996	66.607	.000[b]
	Residual	69.351	165	.420		
	Total	97.347	166			

a. Dependent Variable: Mean_FWRB

b. Predictors: (Constant), Mean_Intention

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	1.996	.404		4.945	.000	1.199	2.793		
	Mean_Intention	.844	.103	.536	8.161	.000	.640	1.048	1.000	1.000

a. Dependent Variable: Mean_FWRB

Appendix E2: Mediation Analyses

Appendix E2.1: Mediation Analysis of Attitude, Intention, and Food Waste Reduction Behavior

```
Standardized coefficients
          coeff
M_AT      .3929

Covariance matrix of regression parameter estimates:
           constant       M_AT
constant      .2371     -.0541
M_AT         -.0541      .0125


************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **************

Total effect of X on Y
     Effect         se          t          p       LLCI       ULCI       c_cs
      .6138      .1119     5.4880      .0000      .3930      .8347      .3929

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI      c'_cs
      .3375      .1088     3.1026      .0023      .1227      .5522      .2160

Indirect effect(s) of X on Y:
          Effect     BootSE   BootLLCI   BootULCI
M_INT      .2764      .0768      .1435      .4440

Completely standardized indirect effect(s) of X on Y:
          Effect     BootSE   BootLLCI   BootULCI
M_INT      .1769      .0454      .0935      .2714

************************ ANALYSIS NOTES AND ERRORS ************************

Level of confidence for all confidence intervals in output:
  95.0000
```

Appendix E2.2: Mediation Analysis of Subjective Norm, Intention, and Food Waste Reduction Behavior

```
Standardized coefficients
          coeff
M_SN      .1618

Covariance matrix of regression parameter estimates:
           constant       M_SN
constant      .0742     -.0209
M_SN         -.0209      .0062


************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **************

Total effect of X on Y
     Effect         se          t          p       LLCI       ULCI       c_cs
      .1655      .0786     2.1055      .0368      .0103      .3208      .1618

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI      c'_cs
      .0565      .0687      .8215      .4126     -.0793      .1922      .0552

Indirect effect(s) of X on Y:
          Effect     BootSE   BootLLCI   BootULCI
M_INT      .1091      .0437      .0283      .2010

Completely standardized indirect effect(s) of X on Y:
          Effect     BootSE   BootLLCI   BootULCI
M_INT      .1066      .0403      .0274      .1868

************************ ANALYSIS NOTES AND ERRORS ************************

Level of confidence for all confidence intervals in output:
  95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000
```

Appendix E2.3: Mediation Analysis of Perceived Behavioral Control, Intention, and Food Waste Reduction Behavior

```
Standardized coefficients
            coeff
M_PBC1      .3602

Covariance matrix of regression parameter estimates:
           constant     M_PBC1
constant      .1459     -.0392
M_PBC1       -.0392      .0108


************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **************

Total effect of X on Y
     Effect         se          t          p       LLCI       ULCI       c_cs
      .5149      .1038     4.9591      .0000      .3099      .7200      .3602

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI      c'_cs
      .1133      .1146      .9886      .3243     -.1130      .3395      .0792

Indirect effect(s) of X on Y:
          Effect     BootSE   BootLLCI   BootULCI
M_INT      .4017      .0838      .2498      .5758

Completely standardized indirect effect(s) of X on Y:
          Effect     BootSE   BootLLCI   BootULCI
M_INT      .2809      .0521      .1807      .3844

************************ ANALYSIS NOTES AND ERRORS ************************

Level of confidence for all confidence intervals in output:
  95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000
```

Appendix F: Questionnaires

Research Title: Food Waste Reduction Behavior Among Malaysian Young Adults

Department of Psychology and Counselling
Faculty of Arts and Social Science
Universiti Tunku Abdul Rahman

Introduction
We are conducting a research study to examine the factors that predict food waste reduction behaviors among Malaysian's young adults according to the Theory of Planned Behavior.

This online survey includes several questionnaires that measure an individual's attitude, subjective norm, perceived behavioral control, intention, food waste reduction behaviors, and a demographic sheet. Overall, this survey will require approximately 15 minutes to complete. This research is conducted as a requirement for the subject UAPZ3023 Final Year Project II.

Eligibility Criteria for Our Participants
We are looking for individuals who are: (i) Malaysian, (ii) 18 to 25 years old, (iii) Currently living in Selangor

Procedures and Confidentiality
All information provided will remain private and confidential. The information given will only be reported as group data with no identifying information and only use for academic purposes.

Participation
All the information gathered will remain anonymous and confidential. Your information will not be disclosed to any unauthorized person and would be accessible only to the group members. Participation in this study is voluntary, you are free to withdraw with consent and discontinue participation at anytime without prejudice. Your responses will be coded numerically in the research assignment for the research interpretation. Your cooperation would be greatly appreciated. There are no known risks associated with participating in this study. If you choose to participate in this project, please answer all the questions as honestly as possible and return the completed questionnaire promptly.

Personal Data Protection Statement
Please be informed that in accordance with Personal Data Protection Act 2010 ("PDPA") which came into force on 15 November 2013, Universiti Tunku Abdul Rahman ("UTAR") is hereby bound to make notice and require consent in relation to the collection, recording, storage, usage and retention of personal information.

Notice:
The purposes for which your personal data may be used are inclusive but not limited to:
For assessment of any application to UTAR
For processing any benefits and services
For communication purposes
For advertorial and news
For general administration and record purposes
For enhancing the value of education
For educational and related purposes consequential to UTAR
For the purpose of our corporate governance
For consideration as a guarantor for UTAR staff / students applying for his/her scholarship / study loan
Your personal data may be transferred and/or disclosed to a third party and/or UTAR collaborative partners including but not limited to the respective and appointed outsourcing agents for purpose of fulfilling our obligations to you in respect of the purposes and all such other purposes that are related to the purposes and also in providing integrated services, maintaining and storing records. Your data may be shared when required by laws and when disclosure is necessary to comply with applicable laws.
Any personal information retained by UTAR shall be destroyed and/or deleted in accordance with our retention policy applicable to us in the event such information is no longer required.
UTAR is committed to ensuring the confidentiality, protection, security, and accuracy of your personal information made available to us and it has been our ongoing strict policy to ensure that your personal information is accurate, complete, not misleading, and updated. UTAR would also ensure that your personal data shall not be used for political and commercial purposes.

Contact Information
If you have any questions or concerns regarding this study, please contact:

Chan Hooi Mui
Telephone Number: +6018-236 5069
Email Address: hm.chan@1utar.my

Shirley Lok Xiao Rui
Telephone Number: +6012-991 4759
Email Address: shirlxr01@1utar.my

Tee Hui Lin
Telephone Number: +6011-3112 6647
Email Address: hltee2001@1utar.my

Ethical Approval Reference Number:
U/SERC/02/2023

If you meet the eligibility requirements and wish to participate in this study, please click on the next button to proceed to the next page. However, if you wish to leave this study, you can do so by closing the page.

DECLARATION
Below are the eligibility criteria to participate in this study. Please kindly check the boxes below to verify your eligibility. *(You can choose more than one option)*

- ☐ I'm a Malaysian.
- ☐ I'm between 18 and 25 years old.
- ☐ I'm currently LIVING in Selangor.
- ☐ I have not participated in this questionnaire online before.

CONSENT
I have read the consent form and the potential risks mentioned. I voluntarily consent and agree to participate in this study. By submitting this form, I authorize and consent to processing (including disclosing) my personal data and any updates of my information, for the purposes and/or for any other purposes related to the purpose. I certify that all the information that I have provided is true. I understand that if I do not consent or subsequently withdraw my consent to the processing and disclosure of my personal data, UTAR will not be able to fulfill our obligations or to contact me or to assist me in respect of the purposes and/or for any other purposes related to the purpose.

- ○ I have read and understood the consent form. I agree to participate in this study.
- ○ I DO NOT agree to participate. I wish to leave the study and my personal data will not be processed.

Signed by,

_____

Date: ____ / ____ / 2023

DEFINITION OF FOOD WASTE REDUCTION BEHAVIOR
Before we proceed, we would like to ensure that you have a clear understanding of what does "food waste reduction behavior" mean. **Food waste reduction behavior refers to any actions taken by you that results in lesser food being thrown away.**

Part A: Attitude towards Food Waste Reduction Behavior

Instructions: Please tell us **what you think about reducing food waste** by indicating how much you agree or disagree with the statements below. There are no right or wrong responses as we are merely interested in your personal opinion.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongl Agree
1. I think reducing food wastage is very important.	○	○	○	○	○
2. I think reducing food wastage makes me very happy.	○	○	○	○	○
3. I think reducing food wastage is very sensible. *(a person who is sensible is able to make good and reasonable decision based on rational rather than emotion.)*	○	○	○	○	○
4. I think reducing food wastage is very good.	○	○	○	○	○
5. I think reducing food wastage is very comfortable.	○	○	○	○	○

Part B: Subjective Norms about Food Waste Reduction Behavior

Instructions: Please share with us what **the people around you think or act** when it comes to reducing food waste. Again, there are no right or wrong responses. Thus, read the following statements and for each, indicate how much you agree or disagree with these statements.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1. Most people who are important to me believe that I should reduce food wastage.	○	○	○	○	○
2. People often ask me to reduce food wastage.	○	○	○	○	○
3. It is expected of me to reduce food wastage.	○	○	○	○	○
4. I feel under social pressure to reduce food wastage.	○	○	○	○	○
5. People who are similar to me reduce food wastage.	○	○	○	○	○

Part C: Perceived Behavioral Control over Food Waste Reduction Behavior

Instructions: Please take a few minutes to recall your past experience related to reducing food waste in the **past 1 month**. Then, share with us how easy or difficult it is for you to reduce food waste by indicating how much you agree or disagree with the statements below.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strong Agree
1. I find it easy to prepare new meals from the leftover food.	○	○	○	○	○
2. I find it easy to make sure that only very small amount of food is discarded in my household.	○	○	○	○	○
3. I find it easy to plan my food shopping in such a way that all the food I purchase is eaten.	○	○	○	○	○
4. I have the feeling that I can do something about the food wasted in my household.	○	○	○	○	○
5. People around me make it possible for me to reduce the amount of food wastage.	○	○	○	○	○
6. This is an attention check question. Please select the "Disagree" option	○	○	○	○	○

Part C: Perceived Behavioral Control over Food Waste Reduction Behavior (Cont.)

Instructions: Please answer each of the following questions by choosing the option that best describes your opinion. Some of the questions may appear to be similar, but they do address somewhat different issues. Please read each question carefully.

7. How much control do you have over whether you reduce food waste in your daily life?	○ **Very Little Control**	○ **A Little Control**	○ **Moderate Amount of Control**	○ **A Lot of Control**	○ **A Great Deal of Control**
8. How difficult would it be for you to reduce food waste in your daily life?	○ **Very Difficult**	○ **Somewhat Difficult**	○ **Neither Easy nor Difficult**	○ **Somewhat Easy**	○ **Very Easy**
9. It is mostly up to me whether I reduce food waste in my daily life.	○ **Strongly Disagree**	○ **Disagree**	○ **Neither Agree nor Disagree**	○ **Agree**	○ **Strongly Agree**

Part D: Intention towards Food Waste Reduction Behavior

Instructions: Please share with us your current intention to reduce food waste for the **next three months** by indicating how much you agree or disagree with the statements below. Again, there are no right or wrong responses as we are merely interested in your personal opinions.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strong Agree
1. I am willing to make extra effort to reduce food wastage.	○	○	○	○	○
2. My personal goal is to reduce as much food wastage as possible.	○	○	○	○	○
3. I will make every effort to produce only very little food waste.	○	○	○	○	○
4. I have seriously thought of using all food leftovers.	○	○	○	○	○
5. I have a firm intention to reduce food wastage in the future.	○	○	○	○	○

Part E: Food Waste Reduction Behavior

Instructions: Please take a few minutes to recall your experience related to reducing food waste in the **past 1 month**. Then, share with us what do you think of your food waste reduction behavior by indicating how much you agree or disagree with the statements below. Read the statements

Part F: Demographics

Q1. Your Age

_____

Q2. Gender

- ○ Male
- ○ Female

Q3. Ethnicity

- ○ Malay
- ○ Chinese
- ○ Indian
- ○ Others (Please indicate)

_____

Q4. Highest Education Level

- ○ Primary Education Level
- ○ Secondary Education Level
- ○ Pre-University
- ○ Diploma
- ○ Bachelor's Degree
- ○ Master's Degree
- ○ Doctoral Degree / Phd.
- ○ Others (Please indicate)

_____

Q5. Which city are you currently living in? (E.g., Jenjarom, Shah Alam, Subang Jaya)

_____

Q6. How often are you in charge of your own meals (either prepared by yourself or you bought from outside)?

- ○ Never
- ○ Rarely (1 to 2 days per week)
- ○ Sometimes (3 to 4 days per week)
- ○ Most of the time (5 to 6 days per week)
- ○ Every day

Q7. I am currently living

- ○ Alone
- ○ With friends
- ○ With family/relatives

Lucky Draw

We are currently holding a lucky draw contest where we will be giving away **RM10** to **3 lucky participants.** We will personally contact the winners latest by **1st of May 2023**.

If you **wish to participate**, please **fill in** your contact details below.

If you **DO NOT wish to** participate, you **may end the survey** and **submit** your response.

Q1. Email address

_____

Q2. Phone number (E.g., 0161234567)

_____

Appendix G: Ethical Approval for Research Project

UNIVERSITI TUNKU ABDUL RAHMAN DU012(A)
Wholly owned by UTAR Education Foundation Co. No. 578227-M

Re: U/SERC/02/2023

10 January 2023

Dr Pung Pit Wan
Head, Department of Psychology and Counselling
Faculty of Arts and Social Science
Universiti Tunku Abdul Rahman
Jalan Universiti, Bandar Baru Barat
31900 Kampar, Perak.

Dear Dr Pung,

Ethical Approval For Research Project/Protocol

We refer to the application for ethical approval for your students' research project from Bachelor of Social Science (Honours) Psychology programme enrolled in course UAPZ3013/UAPZ3023. We are pleased to inform you that the application has been approved under Expedited Review.

The details of the research projects are as follows:

No	Research Title	Student's Name	Supervisor's Name	Approval Validity
1.	Personality Traits and Masculinity as Predictors of Homophobia Among Malaysian Young Man	1. Chiew Yee Kuan 2. Esther Ching Qian Han 3. Ling Chui Hong	Dr Chie Qiu Ting	10 January 2023 – 9 January 2024
2.	Social Media Use and Self-esteem as Predictors of the Risk of Experimentation with e-cigarettes Among University Students in Malaysia: Peer Influence as Mediator	1. The Xin Rou 2. Tam Jing Yi Evelyn 3. Yap Xue Li		
3.	"The Soft Things That We Hold Onto" – A Study on the Association Between Attachment Styles, Presence of Transitional Objects and Psychological Security Among Malaysian Young Adults	1. Poon Ying Ying 2. Chow Yu Ying 3. Sam Hei Man		
4.	The Predicting Effects of Attitudes, Subjective Norms, Perceived Behavioral Control on the Intention Towards Food Waste Reduction Behavior Among Malaysian Young Adults	1. Chan Hooi Mui 2. Shirley Lok Xiao Rui 3. Tee Hui Lin	Dr Gan Su Wan	
5.	Parent-Child Relationship, Perceived Social Support, and Perceived Discrimination as Predictors of Well-Being Among LGBTQ Emerging Adults in Malaysia	1. Haw Ying Huei 2. Lee Nie 3. Yashnevathy a/p Govindasamy		
6.	Personal Growth Initiative, Self-efficacy and Social Support as Predictors of Life Satisfaction Among Undergraduate Students in Malaysia	1. Diu Jia Suan 2. Chow Wen Chung 3. Tneh Sin Lin		
7.	Self-esteem, Locus of Control and Hopelessness as Predictors of Depression Among University Students in Malaysia	1. Cheang Yen Thung 2. Chuah Yue Xuan 3. Kelvin Goh Wei Jin	Dr T'ng Soo Ting	

No	Research Title	Student's Name	Supervisor's Name	Approval Validity
8.	Personality Traits and Masculinity as Predictors of Homophobia Among Malaysian Young Man	1. Chiew Yee Kuan 2. Esther Ching Qian Han 3. Ling Chui Hong	Dr Chie Qiu Ting	10 January 2023 – 9 January 2024
9.	Determinants of Psychological Well-being Among Single Young Adults in Malaysia: Attitudes Towards Singlehood, Stereotypes and Social Support	1. Kan Vivian 2. Ngo Da Long 3. Wong Jia Man	Dr Nurul Iman Binti Abdul Jalil	
10.	Self-control, Chronotype, and Future Time Perspective as Predictors of Bedtime Procrastination Among Malaysian Young Adults	1. Isaac Lai Lik Jun 2. Leong Syn Jieh 3. Tan Hor Yinn		
11.	Perceived Stress, Resilience, Self-esteem as Predictors of Life Satisfaction Among University Students in Malaysia	1. Chueh Di-An 2. Hen Cavin 3. Lim Ya Xuan		
12.	The Relationship Between Smartphone Addiction, Internet Gaming Disorder (IGD), and Sleeping Problem (Insomnia) Among Young Undergraduate Students in Malaysia	1. Leong Lerk Yung 2. Liew Yee Hang 3. Shin Bin Shyen	Dr Ooh Seow Ling	
13.	Pornography Use, Body Image, and Relationship Satisfaction Among Malaysian Young Adults	1. Wong Wan Ching 2. Hen Zi Wei 3. Teeba Suriya a/p Kumar		
14.	Anxiety, Social Support and the Association with Psychological Well-Being Among Undergraduate Students	1. Sherine Divya a/p Pubalan 2. Nisa a/p Jothi		
15.	Loneliness and Perceived Social Support as the Predictor of Internet Addiction Among Undergraduates in Malaysia	1. Tan Jia Chyi 2. Tan Tong Yen 3. Vong Yang Yi	Dr Pung Pit Wan	
16.	Depression and Self-efficacy as Predictor to Academic Procrastination Among Undergraduate Students in Malaysia	1. Ricken Chung Li Ken 2. Tay Chong Leng 3. Joel Lee Xin Wei		
17.	Parenting Style as Predictors of Prosocial Behaviours Among Undergraduates in Malaysia	1. Wendy Tan Syn Yao 2. Liong Chu Lam		
18.	Relationship Among Self-control, Grit and Academic Procrastination Among Undergraduates in Malaysia	1. Cheow Pui Kei 2. Lim Jo Yee 3. Yap Yee Qi	Dr Siah Poh Chua	
19.	Dark Triad Personality and Moral Disengagement as the Predictors of Cyberbullying Among Undergraduate Students in Malaysia	1. Li Xin Yan 2. Hew Hui Teng 3. Loh Shao Heng		
20.	The Relationship Between Self-control, Coping Strategy and Online Game Addiction Among Undergraduate Students in Malaysia	1. Lim Chia Huey 2. Lim Shu Yee 3. Tan Shi Wei		
21.	Does Being Angry Dismiss Me from Moral Norm-keeping? An Experimental Study on the Mediating Relationship of Moral Disengagement on Anger and Cyberbullying Intention	1. Chen Win Chuan 2. Tanreet Kaur a/p Suakwinder Singh 3. Wong Puy Lyng	Dr Tan Chee Seng	
22.	The Relationship Between Autonomy, Subjective Socioeconomic Status, and Exposure to Alternative Partners on Social Media and Attitude Towards Singlehood Among Adults in Malaysia	1. Chong Yoke Sun 2. Denisha a/p Vislnasan 3. Lahvaanya a/p Pannir Selvem		
23.	Intimate Partner Violence and Psychological Distress Among Couples in Malaysia: The Role of Stockholm Syndrome	1. Samantha Ng Hui Li 2. Juliana Hoo Ju Yun	Mr Tan Soon Aun	
24.	The Mediating Role of Stress Between the Relationship of Perfectionism & Mental Well Being Among Undergraduates in Malaysia	1. Renukaa a/p Siva Kumar 2. Shabeena Yohanes a/p Stevenraj 3. Yugesh a/p Santara Sheeran		
25.	The Relationship Between Mental Health Literacy, Help-seeking Behaviour, and Socioeconomic Status Among Young Adults in Malaysia	1. Ang Yu Lun 2. Ch'ng Wei Sheng 3. Chua Leewen	Mr Tay Kok Wai	

No	Research Title	Student's Name	Supervisor's Name	Approval Validity
26.	Sex Addiction is Associated with Personality, Social Circles, and Mental Health Issues	1. Loke Win Yi 2. Ng Zhen Le 3. Tey Cre Ying	Mr Tay Kok Wai	10 January 2023 – 9 January 2024
27.	The Relationship Between Body Mass Index (BMI), Social Media Intensity and Body Image on Anxiety Among Youths in Malaysia	1. Angelina Gin Ger Ong 2. Kumetni a/p Gobi 3. Shirley Jesslynna a/p Jayaseelan		
28.	Family Functioning, Childhood Trauma, and Self-esteem as the Predictors of Social Anxiety Among Malaysian University Students	1. Jivithan a/l Sasidaran 2. Merlena Ann Mariasoosai 3. Sela a/p Sobin Mondal		
29.	Relationship Between Vocal Fatigue, Emotion, and Motivation with Mask-wearing Among Kampar UTAR Educators	1. Celine Tan Si Min 2. Chong Yueen Cheng 3. Loo Xin Yan	Ms Lee Wan Ying	
30.	The Relationship Between Gender Role Attitudes, Attitudes Toward Childbearing, Family Functioning and Attitudes Toward Marriage Among Young Adults in Malaysia	1. Choo May Yan 2. Chloe Ng Chu Yin 3. Claryce Cheong Yong Qing		
31.	A Study on Materialism, Anxiety and Gender Differences in Compulsive Buying Behaviors Among Young Adults in Malaysia	1. Lim Shi Yuan 2. Lim Yit Han 3. Loh Carmen		
32.	Post-traumatic Stress Disorder (PTSD) as The Predictor of Emotional Well-being and Resilience Among Undergraduate Students During the COVID-19 Outbreak	1. Darshinee a/p Arudkanth 2. Divya Tharshini a/p Puantharan 3. Nivethah a/p Kalaiyarasan	Ms Liza Hartini Binti Rusdi	
33.	The Relationship Between Living Standard and Mental Health Literacy Among Youth in Malaysia	1. Su Kailun 2. Chew Weng Kit 3. Vinnosha a/p K Jeyaseelan		
34.	Relationship Between Loneliness, Self-esteem and Binge Eating Among Undergraduates in Malaysia	1. Ong Ting Wei 2. Ng Chien Yi 3. Lim Wei Fang		
35.	The Influence of Job Stress and Resilience on Job Satisfaction Mediated by Work-life Balance Among Lecturers in Universiti Tunku Abdul Rahman	1. Lee Jun Kang 2. Foong Wei How 3. Luo Wen	Ms Sanggari a/p Krishnan	
36.	Mindfulness, Resilience, and Work-Family Conflict Predict Job Performance Among Working Adults	1. Teoh Yi Wen 2. Cheah Jie Min 3. Lott Sin Yee		
37.	Compulsive Internet Use, Self-esteem, Self-efficacy as Predictors of Academic Procrastination Among Undergraduate Student	1. Lin Xingyi 2. Wong Xin Lynn 3. Zhan Shuwei	Ms Teoh Xi Yao	
38.	Relationship Between Self-esteem, Loneliness, Stress and Excessive Use of Social Media Among Undergraduate Students in Malaysia	1. Lee Hao Yan 2. Daniel Chow Weng Kin 3. Fong Zhen Yann		
39.	An Exploratory Study on the Impacts of Social Media on Malaysian Young Adults' Psychological Wellbeing	1. Rae Oon El Jin 2. Kelvin Lim Zhi Jian 3. Huang Jing Fei	Pn Wirawahida Binti Kamarul Zaman	
40.	A Case Study: Parenting Practices of Millennial Single Fathers and Its Effects on Children	1. Chua Ng Gie 2. Paige Chee Hui Min 3. Pearl Lee Yi Yao		

The conduct of this research is subject to the following:

(1) The participants' informed consent be obtained prior to the commencement of the research;

(2) Confidentiality of participants' personal data must be maintained; and

(3) Compliance with procedures set out in related policies of UTAR such as the UTAR Research Ethics and Code of Conduct, Code of Practice for Research Involving Humans and other related policies/guidelines.

(4) Written consent be obtained from the institution(s)/company(ies) in which the physical or/and online survey will be carried out, prior to the commencement of the research.

Should the students collect personal data of participants in their studies, please have the participants sign the attached Personal Data Protection Statement for records.

Thank you.

Yours sincerely,

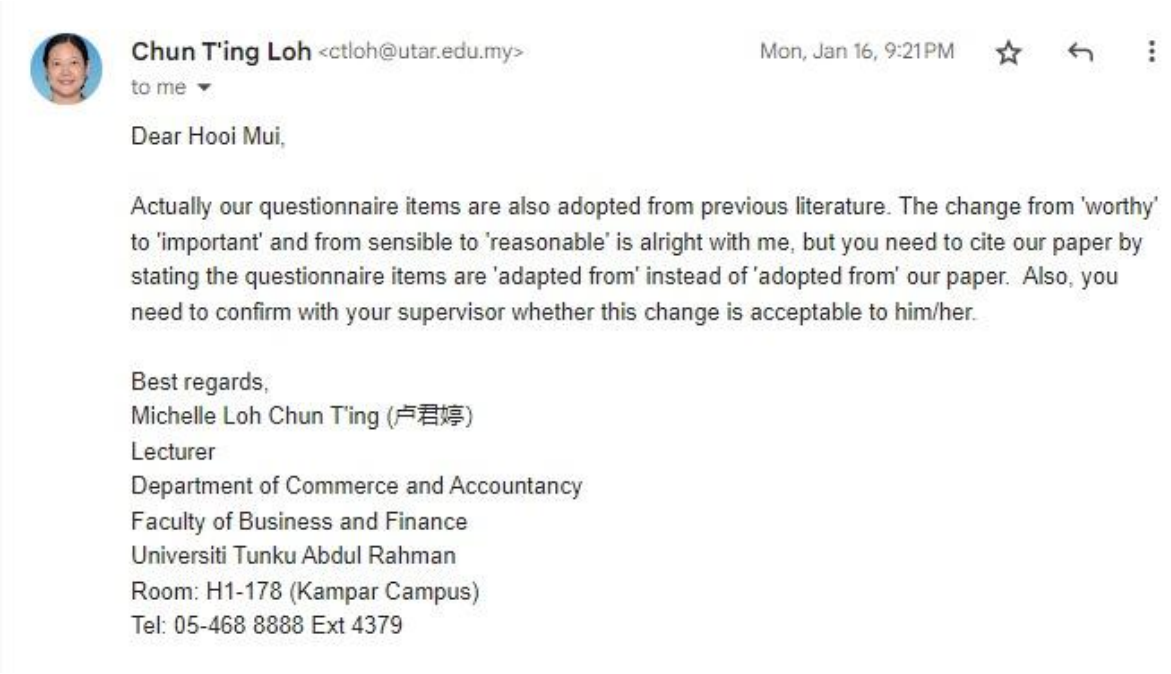
Professor Ts Dr Faidz bin Abd Rahman
Chairman
UTAR Scientific and Ethical Review Committee

c.c Dean, Faculty of Arts and Social Science
Director, Institute of Postgraduate Studies and Research

Kampar Campus : Jalan Universiti, Bandar Barat, 31900 Kampar, Perak Darul Ridzuan, Malaysia
Tel: (605) 468 8888 **Fax**: (605) 466 1313
Sungai Long Campus: Jalan Sungai Long, Bandar Sungai Long, Cheras, 43000 Kajang, Selangor Darul Ehsan, Malaysia
Tel: (603) 9086 0288 **Fax**: (603) 9019 8868
Website: www.utar.edu.my

Appendix H: Approval Questionnaires from Authors

Appendix H1: Attitude, Subjective Norm, Perceived Behavioral Control, and Intention Questionnaires



Chun T'ing Loh <ctloh@utar.edu.my> Mon, Jan 16, 9:21 PM

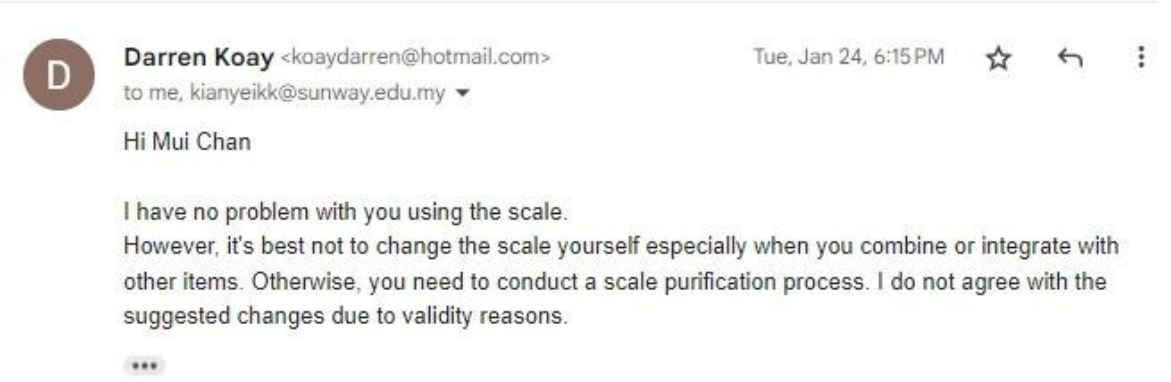
to me

Dear Hooi Mui,

Actually our questionnaire items are also adopted from previous literature. The change from 'worthy' to 'important' and from sensible to 'reasonable' is alright with me, but you need to cite our paper by stating the questionnaire items are 'adapted from' instead of 'adopted from' our paper. Also, you need to confirm with your supervisor whether this change is acceptable to him/her.

Best regards,
Michelle Loh Chun T'ing (卢君婷)
Lecturer
Department of Commerce and Accountancy
Faculty of Business and Finance
Universiti Tunku Abdul Rahman
Room: H1-178 (Kampar Campus)
Tel: 05-468 8888 Ext 4379

Appendix H2: Food Waste Reduction Behavior Questionnaire



Darren Koay <koaydarren@hotmail.com> Tue, Jan 24, 6:15 PM

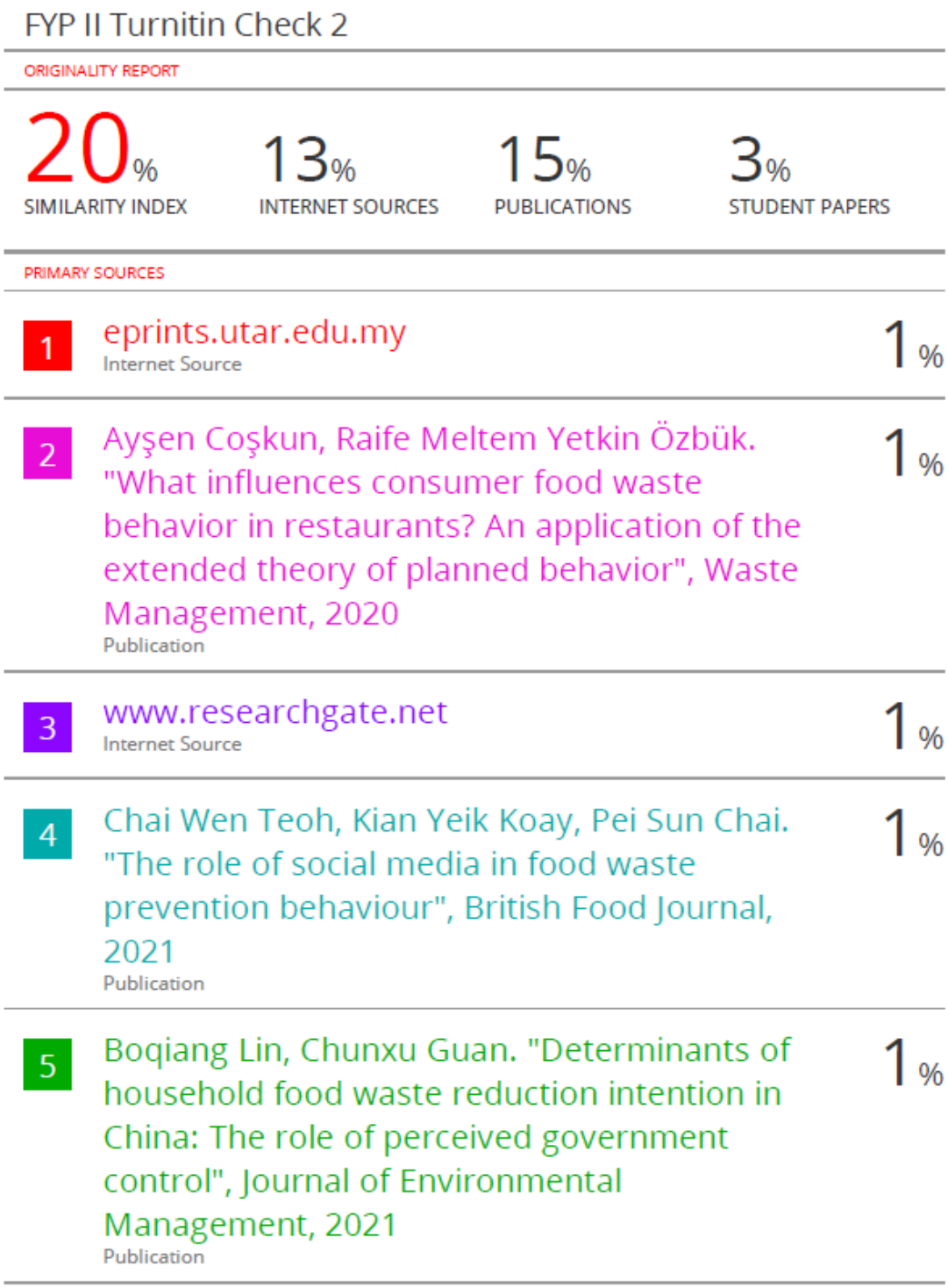
to me, kianyeikk@sunway.edu.my

Hi Mui Chan

I have no problem with you using the scale.
However, it's best not to change the scale yourself especially when you combine or integrate with other items. Otherwise, you need to conduct a scale purification process. I do not agree with the suggested changes due to validity reasons.

•••

Appendix I: Turnitin Report FYP II



FYP II Turnitin Check 2

ORIGINALITY REPORT

20%	13%	15%	3%
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PRIMARY SOURCES

1	eprints.utar.edu.my Internet Source	1%
2	Ayşen Coşkun, Raife Meltem Yetkin Özbük. "What influences consumer food waste behavior in restaurants? An application of the extended theory of planned behavior", Waste Management, 2020 Publication	1%
3	www.researchgate.net Internet Source	1%
4	Chai Wen Teoh, Kian Yeik Koay, Pei Sun Chai. "The role of social media in food waste prevention behaviour", British Food Journal, 2021 Publication	1%
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Date: 10/04/2023

SUBMISSION OF FINAL YEAR PROJECT/DISSERTATION/THESIS

It is hereby certified that Chan Hooi Mui (ID No: 20AAB01341) has completed this final year project entitled "The Predicting Effects of Attitude, Subjective Norm, Perceived Behavioral Control on the Intention towards Food Waste Reduction Behavior Among Malaysian Young Adults" under the supervision of Dr. Gan Su Wan (Supervisor) from the Department of Psychology and Counselling, Faculty of Arts and Social Science, and _____ (Co-supervisor)* from the Department of _____, Faculty/Institute* of _____.

I understand that University will upload softcopy of my final year project in pdf format into UTAR Institutional Repository, which may be made accessible to UTAR community and public.

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Name: Chan Hooi Mui

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Member 2: Shirley Lok Xiao Rui, 19AAB04095

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Supervisor's Comments on Originality Report: FYP II

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Full Name(s) of Candidate(s)	Chan Hooi Mui, Shirley Lok Xiao Rui, Tee Hui Lin
ID Number(s)	20AAB01341, 19AAB04095, 19AAB03391
Programme / Course	Bachelor of Social Science (Hons) Psychology
Title of Final Year Project	The Predicting Effects of Attitude, Subjective Norms, Perceived Behavioral Control on the Intention towards Food Waste Reduction Behavior Among Malaysia's Young Adults

Similarity	**Supervisor's Comments (Compulsory if parameters of originality exceeds the limits approved by UTAR)**
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Based on the above results, I hereby declare that I am satisfied with the originality of the Final Year Project Report submitted by my student(s) as named above.

Signature of Supervisor

Name:

Date:

Signature of Co-Supervisor

Name:

Date:

FYP II Action Plan Form

Action Plan of UAPZ 3023 (group-based) Final Year Project II for Jan Trimester						
Supervisee's Name:	Chan Hooi Mui, Shirley Lok Xiao Rui, Tee Hui Lin					
Supervisor's Name:	Dr. Gan Su Wan					
Task Description	**Duration**	**Date/Time**	**Supervisee's Signature**	**Supervisor's Signature**	**Supervisor's Remarks**	**Next Appointment Date/Time**
Methodology, Data Collection & Data Analysis	W1-W5		Shirley HooiMui	gansuwan	Finalised questionnaire, and discuss pilot test.	
Pilot Test & Analysis	W1-W2	1/2/2023 & 08/02/2023	Huilin			
Actual Data Collection (x363)	W2-W4	15/02/2023 & 22/02/2023				
Data Analysis	W5-W6	8/3/2023		gansuwan	Check pilot test.	
Finding & Analysis			Shirley HooiMui	gansuwan	Discuss Pilot test results and run real test.	
Discuss Findings & Analysis with Supervisor	W6-W8	24/03/2023	Huilin			
Amending Findings & Analysis	W9-W10	29/03/2023		gansuwan	Discuss normality test and data cleaning.	
Discussion & Conclusion			Shirley HooiMui	gansuwan	Discuss data interpretation and chapter5.	
Discuss Discussion & Conclusion with Supervisor	W10	5/4/2023	Huilin			
Amending Discussion & Conclusion	W10	7/4/2023 - 10/4/2023				
Submission of first draft*	W10	submit the first draft to Turnitin.com to check similarity rate				
Amendment	W10					
Submission of final FYP (FYP I + FYP II)*	W11	final submission to supervisor				
Oral Presentation	W12	Oral Presentation Schedule will be released and your supervisor will inform you				

Notes 1. The listed duration is for reference only, supervisors can adjust the period according to the topics and content of the projects.
2. *Deadline for submission can not be changed, one mark will be deducted per day for late submission.
3. Supervisees are to take the active role to make appointments with their supervisors.
4. Both supervisors and supervisees should keep a copy of this record. 5. This record is to be submitted together with the submission of the FYP II.

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FACULTY OF ARTS AND SOCIAL SCIENCE
DEPARTMENT OF PSYCHOLOGY AND COUNSELLING

UAPZ 3023 Final Year Project II

Quantitative Research Project Evaluation Form

TURNITIN: ***'In assessing this work you are agreeing that it has been submitted to the University-recognised originality checking service which is Turnitin. The report generated by Turnitin is used as evidence to show that the students' final report contains the similarity level below 20%.'***

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Supervisor: Dr. Gan Su Wan	
Student's Name: 1. Chan Hooi Mui 2. Shirley Lok Xiao Rui 3. Tee Hui Lin	Student's ID 1. 20AAB01341 2. 19AAB04095 3. 19AAB03391

INSTRUCTIONS:
Please score each descriptor based on the scale provided below:

1. Please award 0 mark for no attempt.
2. For criteria **7**:
   Please retrieve the marks from "**Oral Presentation Evaluation Form**".

1. ABSTRACT (5%)	**Max Score**	**Score**
a. State the main hypotheses/research objectives.	5%	
b. Describe the methodology: • Research design • Sampling method • Sample size • Location of study • Instruments/apparatus/outcome measures • Data gathering procedures	5%	
c. Describe the characteristics of participants.	5%	
d. Highlight the outcomes of the study.	5%	
e. Conclusions, implications, and applications.	5%	
Sum	25%	/25%
Subtotal (Sum/5)	5%	/5%
Remark:		

2. METHODOLOGY (25%)	**Max Score**	**Score**
a. Research design/framework: • For experiment, report experimental manipulation, participant flow, treatment fidelity, baseline data, adverse events and side effects, assignment method and implementation, masking. (*if applicable with the study design) • For non-experiment, describe the design of the study and data used.	5%	
b. Sampling procedures: • Justification of sampling method/technique used. • Description of location of study. • Procedures of ethical clearance approval. (Provide reference number of approval letter)	5%	
c. Sample size, power, and precision: • Justification of sample size. • Achieved actual sample size and response rate. • Power analysis or other methods (if applicable).	5%	
d. Clear explanation of data collection procedures: • Inclusion and exclusion criteria • Procedures of obtaining consent • Description of data collection procedures • Provide dates/duration of recruitment repeated measures or follow-up. • Agreement and payment (if any)	5%	
e. Explanation of instruments/questionnaire used: • Description of instruments • Scoring system • Meaning of scores	5%	

• Reliability and validity		
Subtotal	25%	/25%
Remark:		
3. RESULTS (20%)	**Max Score**	**Score**
a. Descriptive statistics: • Demographic characteristics • Topic-specific characteristics	5%	
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Subtotal	20%	/20%
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a. Constructive discussion of findings: • Provide statement of support or nonsupport for all hypotheses. • Analyze similar and/or dissimilar results. • Rational justifications for statistical results.	8%	
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d. Recommendations for future research.	4%		
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Subtotal	/20%	/20%	/20%
Remark:			
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*****Overall Comments:**

Signature: _____ Date: _____

Notes:

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   (ii) **Matching of individual sources listed must be less than 3%** each, and
   (iii) Matching texts in continuous block must **not exceed 8 words**

   Note: Parameters (i) – (ii) shall exclude quotes, references and text matches which are less than 8 words.

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