# CHAPTER 4

# DATA ANALYSIS AND FINDINGS

4.1 Introduction

4.2 Descriptive Analysis

4.3 Normality Test

4.4 Reliability Validity

4.5 Validity Test

4.6 Correlation Analysis

4.7 Multiple Regression

4.7 Summary

# 4.0 DATA ANALYSIS AND FINDINGS

## 4.1 Introduction

This chapter will cover the data analysis, which includes the normality test, descriptive analysis, correlation analysis and multiple regression tests. Each analysis will interpret and answer the research questions. In the normality test, if the samples are normally distributed, further analysis will include the parametric technique, and if not normally distributed, then the non-parametric technique will be used. Descriptive analysis will describe the respondents' demographic profile. Validity and reliability are important to evaluate whether the samples collected are valid and consistent; therefore, the Cronbach's alpha technique will be used for the reliability test. Factor analysis will be used to evaluate the validity of the samples. The correlation test and multiple regression test will be used to further analyse and explore the relationship between two variables.

## 4.1 Descriptive Analysis

The questionnaire was distributed to the public both by hand and online. A total of 338 useable questionnaires were collected. There were 288 usable questionnaires collected from online and 50 from physical questionnaires. There was no missing data. The main objective for descriptive analysis is to understand

the profile of the respondent. Table 4.1 below shows a summary of the description analysis.

Table 4.1 Demographic Profile of the Respondents

| Variable | Category | Frequency, N | Percentage |
|---|---|---|---|
| Gender | Female | 201 | 59.5% |
| | Male | 137 | 40.5% |
| | Total | 338 | 100.0% |
| Age | 21-30 years | 210 | 62.1% |
| | 31-40 years | 100 | 29.6% |
| | 41-50 years | 21 | 6.2% |
| | 51-60 years | 6 | 1.8% |
| | Above 60 years | 1 | 0.3% |
| | Total | 338 | 100.0% |
| Marital Status | Single | 184 | 54.4% |
| | Married | 149 | 44.1% |
| | Divorced/widow | 5 | 1,5% |
| | Total | 338 | 100.0% |
| Ethnic Group | Malay | 32 | 9.5% |
| | Chinese | 283 | 83.7% |
| | Indian | 7 | 2.1% |
| | Others | 16 | 4.7% |
| | Total | 338 | 100.0% |
| Education Level | Primary | 3 | 0.9% |
| | Secondary | 8 | 3.3% |
| | Diploma/Certificate | 37 | 10.9% |
| | Bachelor Degree | 229 | 67.8% |
| | Master Degree | 58 | 17.2% |
| | PhD | 3 | 0.9% |
| | Total | 338 | 100.0% |
| Occupation | Student | 24 | 7.1% |
| | Housewife | 4 | 1.2% |
| | Non-Executive Level | 17 | 5.0% |
| | Executive | 135 | 39.9% |
| | Manager | 72 | 21.3% |
| | Professional | 58 | 17.2% |
| | Director | 6 | 1.8% |
| | Self-employed | 15 | 4.4% |
| | Others | 7 | 2.1% |
| | Total | 338 | 100.0% |
| Monthly Income | Below RM 2000 | 16 | 4.7% |
| | RM 2001 - RM4000 | 128 | 37.9% |
| | RM 4001 – RM6000 | 88 | 26.0% |
| | RM 6001 – RM 8000 | 36 | 10.7% |
| | RM 8001 and above | 47 | 13.9% |
| | N/A | 23 | 6.8% |
| | Total | 338 | 100.0% |
| Family Size | 1 | 45 | 13.3% |
| | 2 | 53 | 15.7% |
| | 3 | 66 | 19.5% |
| | 4 | 64 | 18.9% |
| | 5 | 73 | 21.6% |

| | | | |
|---|---|---|---|
| | 6 | 23 | 6.8% |
| | 7 | 6 | 1.8% |
| | 8 | 2 | 0.6% |
| | 9 | 5 | 1.5% |
| | 10 | 1 | 0.3% |
| | Total | 338 | 100.0% |
| Monthly Grocery Shopping | 0 | 1 | 0.3% |
| | 1-2 | 114 | 33.7% |
| | 3-4 | 144 | 42.6% |
| | 5-6 | 49 | 14.5% |
| | 7-8 | 18 | 5.3% |
| | 9-10 | 12 | 3.6% |
| | Total | 338 | 100.0% |
| The Most Regularly Visited Grocery Shopping Centre | Tesco | 105 | 31.1% |
| | Giant | 50 | 14.8% |
| | Carrefour | 60 | 17.8% |
| | Cold Storage | 11 | 3.3% |
| | Jusco Supermarket | 79 | 23.4% |
| | Others | 33 | 9.8% |
| | Total | 100 | 100.0% |

**Gender**

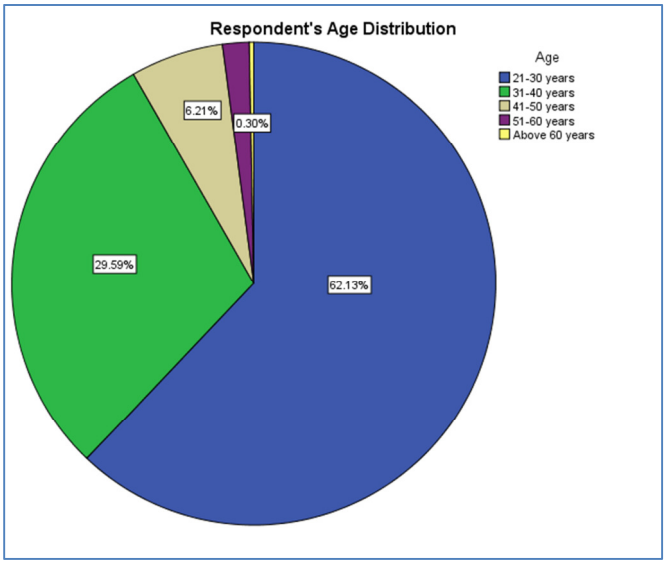
In this study there are a total of 201 (59.5%) female respondents and 137 (40.5%) male respondents. The percentage shows that the female respondents are much higher than the male respondents.

**Age**

In this study, the majority of the respondents are from the age group 21-30 years, with 210 respondents (62.1%), followed by the age group of 31-40 years, with 100 respondents representing 29.6% of the study. The minority of the respondents are from the age groups, 41-50 years, 51-60 years and above 60 years, with 21, 6 and 1 respondent(s), representing 6.2%, 1.8% and 0.3%, respectively. The majority of the respondents are aged 21-40, which represents about 91.7% of this study. This is because the questionnaires were distributed at

the University of Malaya and online using Facebook, email and instant messenger. Figure 4.1 shows the respondent's age distribution.

Figure 4.1 Age Distribution of Respondents




**Marital Status**

There are 184 single respondents, 149 who are married and only 5 respondents who are divorced/widowed, which represents 54.4%, 44.1% and 1.5%, respectively.

**Ethnic group**

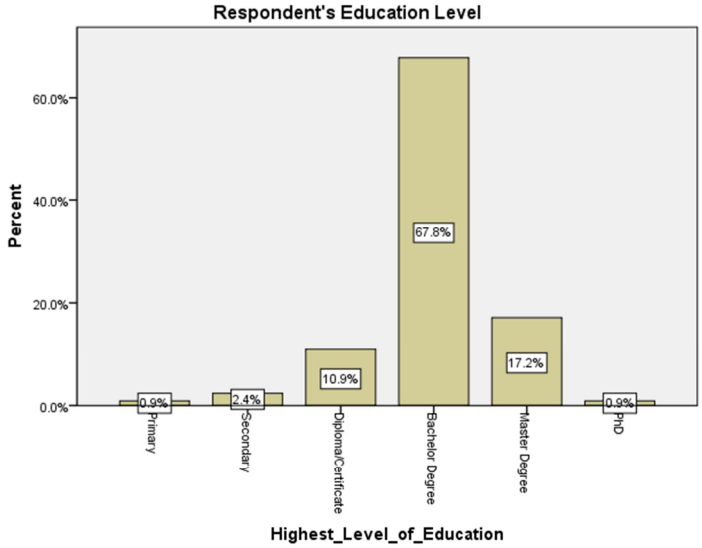
There are four ethnic groups: Malay, Chinese, Indian and others. Chinese respondents comprise the majority of respondents, contributing about 83.7% (283 respondents). The Malay, Indian and 'others' ethnic groups are the minority with 9.5% (32 respondents), 2.1% (7 respondents), and 4.7% (16 respondents),

respectively. The majority of the respondents are Chinese as most of the questionnaires were collected online.

**Educational Level**

The majority of the respondents are Bachelor Degree holders, with 67.8% or 229 Bachelor Degree holders participating in this study. This is followed by Master Degree respondents, with 58 respondents representing 17.2% in this study. Diploma/Certificate holders are ranked third with 37 respondents (10.9%). The minority of the respondents have a very low education level or very high education level: 3 respondents have primary education level, 8 respondents have secondary education level and 3 respondents are PhD holders thereby representing 0.9%, 2.4% and 0.9%, respectively. Figure 4.2 presents the percentage of the education level of the respondents.

Figure 4.2 Education Level of the Respondents



**Occupation**

The majority of the respondents are executive level, followed by manager level, and professional level, with 135, 72, 58 respondents or 39.9%, 21.3%, 17.2%, respectively. The minority of the respondents are students, housewives, non-executive level, director, self-employed and others, with 24, 4, 17, 6, 15, 7 respondents or 7.1%, 1.2%, 5.0%, 1.8%, 4.4%, 2.1%, respectively. As discussed earlier, the majority of the respondents have a high education level and the age group is from 21-30 years old, therefore, most of them are still in the executive level.

**Monthly Income**

In the monthly income segment, the majority of the respondents have an income of between RM2,001 – RM4,000, which was 128 respondents (37.9%). Followed by the income group of RM4,001 - RM6,000, with 36 respondents (26.0%). Ranked third is RM8,001 and above, with 47 respondents (13.9%) having a high income; 16 respondents (4.7%) have a low income of below RM2,000, and 36 respondents (13.9%) are from the middle-income group with earnings of between RM6,001 and RM8,000. Approximately 6.8% or 23 respondents did not reveal their salary, because they considered that their salary/income is private and did not wish to divulge it. This result is considered logical as the majority of the respondents are aged from 21-30 years and have a high education level. Therefore, their income should be at the level of RM2,000 - RM6,000.

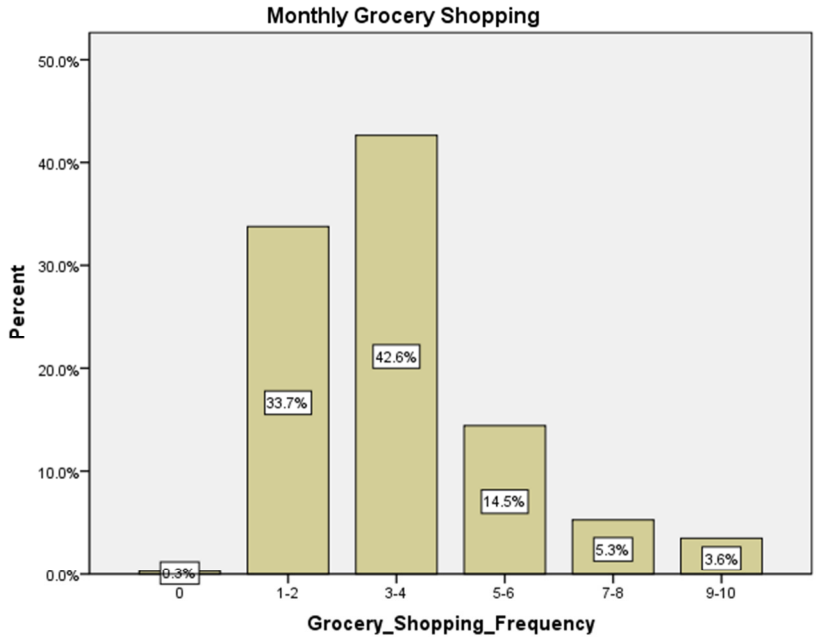
**Family Member**

Respondents who have 5 family members including the respondent himself/herself, are the majority, with 73 respondents (21.6%) having this family size, followed by respondents who have 3 family members and 4 family members, with 66 and 64 respondents, or 19.5% or 18,9%, respectively, having this family size. About 45 respondents or 13.3% are staying alone, and 53 respondents or 15.7% had 2 family members. The minority of the respondents have a large family size with 6, 7, 8, 9, 10 family members, being 23, 6, 2, 5, 1 respondent(s) or 6.8%, 1.8%, 0.6%, 1.5% 0.3%, respectively.

**Monthly grocery shopping**

The majority of respondents, 144 respondents or 42.6%, go monthly grocery shopping about 3-4 times, which is followed by respondents who shop about 1-2 times per month, with 114 respondents or 33.7%. Only 1 respondent does not go grocery shopping each month, while 49 respondents or 14.5% go shopping 5-6 times per month. Respondents who shopped 7-8 and 9-10 times per month are considered a minority, with only 18 and 12 respondents or 5.3% and 3.6%, respectively. Figure 4.3 presents the frequency and percentage of the respondent's monthly grocery shopping.

Figure 4.3 Monthly Grocery Shopping frequency of Respondents




**The Most Regularly Visited Grocery Shopping Centre**

The most popular grocery shopping centre is Tesco hypermarket, with about 105 respondents or 31.1% regularly shopping at Tesco hypermarket. This was followed by Jusco Supermarket, with about 79 respondents or 23.4% who regularly shop in this supermarket. In third rank is Carrefour, with 60 respondents or 17.8% who shop in this hypermarket, while 50 respondents or 14.8% regularly shop at Giant hypermarket. The minority of the respondents preferred shopping at cold storage and other grocery shops, with only 11 and 33 respondents or 3.3% and 9.8%, respectively.

### 4.3 Normality Test

The normality test is to determine the sample size distribution. This is important to understand whether the sample collected falls within an appropriate range and its skewness. If samples are not normally distributed, the non-parametric technique will be used for further tests, and if the samples are normally distributed, the parametric technique will use for further tests. Table 4.2 shows the mean, standard deviation, skewness and kurtosis.

Table 4.2 The Mean, Standard Deviation, Skewness and Kurtosis Of Each Item

| Construct | Item | Mean | Std. Deviation | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Actual Usage of Non-woven bags | SU1 | 5.07 | 1.552 | -.828 | .089 |
| | SU2 | 5.33 | 1.820 | -1.082 | .128 |
| | SU3 | 5.49 | 1.379 | -.972 | .685 |
| | SU4 | 5.63 | 1.695 | -1.137 | .190 |
| | SU5 | 6.26 | 1.217 | -2.368 | 6.353 |
| | SU6 | 4.83 | 1.584 | -.514 | -.511 |
| | SU7 | 4.55 | 1.810 | -.283 | -.976 |
| Altruistic Values | AAC1 | 5.25 | 1.159 | -.709 | 1.050 |
| | AAC2 | 5.44 | 1.217 | -.997 | 1.549 |
| | AAC3 | 6.27 | .928 | -1.989 | 6.808 |
| | AAC4 | 6.07 | .977 | -1.617 | 4.887 |
| | AAC5 | 5.96 | .957 | -.955 | 1.143 |
| | AAC6 | 6.71 | .892 | -4.264 | 20.767 |
| Egoistic Values | EAC1 | 5.41 | 1.309 | -.950 | 1.145 |
| | EAC2 | 3.63 | 1.665 | -.138 | -.900 |
| | EAC3 | 5.32 | 1.127 | -.860 | 1.434 |
| | EAC4 | 5.12 | 1.144 | -.915 | 1.565 |
| Anthropocentric Values | PAC1 | 4.49 | 1.779 | -.482 | -.716 |
| | PAC2 | 5.24 | 1.559 | -.904 | .228 |
| | PAC3 | 4.91 | 1.706 | -.688 | -.451 |
| | PAC4 | 5.64 | 1.361 | -1.223 | 1.322 |
| | PAC5 | 6.21 | 1.051 | -2.050 | 5.797 |
| Ecocentric values | CAC1 | 6.21 | 1.071 | -1.978 | 5.302 |
| | CAC2 | 5.07 | 1.960 | -.776 | -.660 |

| | | | | | |
|---|---|---|---|---|---|
| | CAC3 | 6.49 | .879 | -2.846 | 12.537 |
| | CAC4 | 6.13 | 1.066 | -1.465 | 2.822 |
| | CAC5 | 5.20 | 1.463 | -.793 | .338 |
| | CAC6 | 6.42 | .919 | -2.346 | 8.232 |
| Awareness of Consequences (AC) | AC1 | 6.50 | .993 | -3.025 | 11.661 |
| | AC2 | 6.07 | 1.146 | -1.676 | 3.599 |
| | AC3 | 6.28 | .998 | -1.963 | 5.466 |
| | AC4 | 6.20 | 1.080 | -1.979 | 5.198 |
| | AC5 | 6.01 | 1.170 | -1.450 | 2.682 |
| | AC6 | 5.94 | 1.153 | -1.421 | 2.719 |
| | AC7 | 4.88 | 1.572 | -.549 | -.159 |
| Attribution of Responsibility (AR) | AR1 | 5.50 | 1.379 | -1.156 | 1.495 |
| | AR2 | 5.95 | 1.009 | -1.351 | 3.959 |
| | AR3 | 5.57 | 1.200 | -1.049 | 1.947 |
| | AR4 | 4.08 | 1.722 | .107 | -.826 |
| | AR5 | 4.65 | 2.091 | -.422 | -1.226 |
| Personal Norms (PR) | PR1 | 5.51 | 1.387 | -1.205 | 1.541 |
| | PR2 | 5.59 | 1.300 | -1.163 | 1.618 |
| | PR3 | 5.93 | 1.145 | -1.395 | 2.719 |
| | PR4 | 4.57 | 1.551 | -.335 | -.514 |
| | PR5 | 5.12 | 1.584 | -.741 | .025 |

The highest mean for the variable of actual usage of non-woven bags is SU5, which has a value of 6.26 and the lowest mean value is SU6, which has a value of 4.83. The kurtosis values for SU1 to SU7 are between -2 and 2, which indicate these variables are normal. However, SU5 has a kurtosis value of 6.36, which indicates that this item is not normally distributed, however, further analysis such as Cronbach's alpha will be carried out to test the reliability of this item.

In the construct of altruistic values, the highest mean is AAC3, which has a mean value of 6.27; the lowest mean value is AAC1, which has a mean value of 5.25. The highest skewness value is AAC6, which has a value of -4.264 and the lowest value of skewness value is AAC1, which has a value of -0.709. The kurtosis

values for AAC 3, AAC4 and AAC6 are out of the range -2 to 2, which indicates that these 3 items are not normally distributed.

The highest mean value for variable egoistic values is EAC1, which has a value of 5.41, while the lowest mean value is EAC2, which has a value of 3.63. The kurtosis values are in the range of -2 to 2, therefore, this variable is in the normal range of distribution.

The highest mean value for the variable of anthropocentric is PAC5, which has a value of 6.21, while the lowest mean value is PAC1, which has a value of 4.49. The kurtosis value for this variable is within the normal distribution range (-2 to 2) except PAC5, which has a value of 5.797.

The highest mean value for the ecocentric values is CAC3, which has a value of 6.49, the lowest mean value is CAC2, which has a value of 5.07. Items CAC1. CAC3, CAC4, CAC6 are out of the range for normal distribution (-2 to 2), while CAC2 and CAC5 are within the normal distribution.

The highest mean value for awareness of consequences is AC1, which has a value of 6.50, while the lowest mean value is AC7, which has a mean value of 4.88. Most of the kurtosis values for this variable are not within the normal distribution range (-2 to 2) except AC7, therefore, items 1-6 are not normally distributed.

The highest mean value for the attribution of responsibility is AR2, which has a value of 5.9, while the lowest mean value is AR4, which has a value of 4.08. Most of the kurtosis values are within the normal distribution range (-2 to 2) except AR2, therefore, we can assume this variable is in the normal distribution.

The highest mean value for the personal norm variable is PR2, which has a value of 5.59 and the lowest mean value is PR4, which has a value of 4.57. All items in this variable are within the range of normal distribution (-2 to 2) except PR3, therefore, we can say that overall these values are normally distributed.

According to the data for kurtosis value, most of the items are within the range of normal distribution; therefore, the parametric method will be used for the next analysis.

### 4.4 Reliability Test

The reliability test is a method for checking a scale's internal consistency. We used Cronbach's alpha coefficient as the indicator to check the degree of consistency. The value of Cronbach's alpha for all constructs/variables must be above 0.6. Ideally the Cronbach's alpha should be above 0.7, but as this study was evaluating consumer behaviour, according to Nunnally (1967), the Cronbach's alpha coefficient of a scale can be accepted if above 0.6, therefore,

the Cronbach's alpha in this study is set at 0.6. Overall, all the variables have a Cronbach's alpha coefficient of more than 0.6. However, for the variable of Attribution of Responsibility (AR) the Cronbach's alpha can only achieve more than 0.6 if two items are deleted. We can conclude that all the items in this study are consistent and reliable. Table 4.3 shows the summary of the reliability test.

Table 4.3 Summary of the Cronbach's Alpha of Each Scale

| | **Variable** | **Cronbach's Alpha** | **No. of items** |
|---|---|---|---|
| SU | Actual behaviour of using non-woven bags | 0.75 | 7 |
| AAC | Altruistic value | 0.837 | 6 |
| EAC | Egoistic value | 0.687 | 4 |
| PAC | Anthropocentrism Value | 0.660 | 5 |
| CAC | Ecocentric value | 0.608 | 6 |
| AC | Awareness of Consequences | 0.854 | 7 |
| AR | Attribution of Responsibility | 0.852 | 3 |
| PR | Personal Norm | 0.798 | 5 |

## 4.5 Validity Test

The results of the output were obtained from the validity test using factor analysis. Factor analysis is not for testing the hypothesis purpose but for reducing or summarizing using a smaller set of components, therefore, factor analysis is able to reduce the huge number of related variables to a manageable number before using these variables/items to analyse correlation or multiple regressions. The technique for factor analysis in this study is principle components analysis (PCA).

According to Stevens (1996) and the SPSS survival manual, written by Julie Pallant, if the research direction is more towards psychometrics, one should use the PCA method. Hence, in this study the PCA method was used.

Table 4.4 Table of KMO and Bartlett's Test

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .846 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 2280.249 |
| | Df | 210 |
| | Sig. | .000 |

The 21 items for consumer values were subjected to principle components analysis (PCA) using SPSS. In this analysis, the coefficient was fixed at 0.3. The Kaiser-Meyer-Olkin value is 0.846, which exceeds the acceptance value of 0.6, and the Bartlett's Test of Sphericity reaches statistical significance, which is lower than 0.05.

Table 4.5 Table of Total Variance Explained

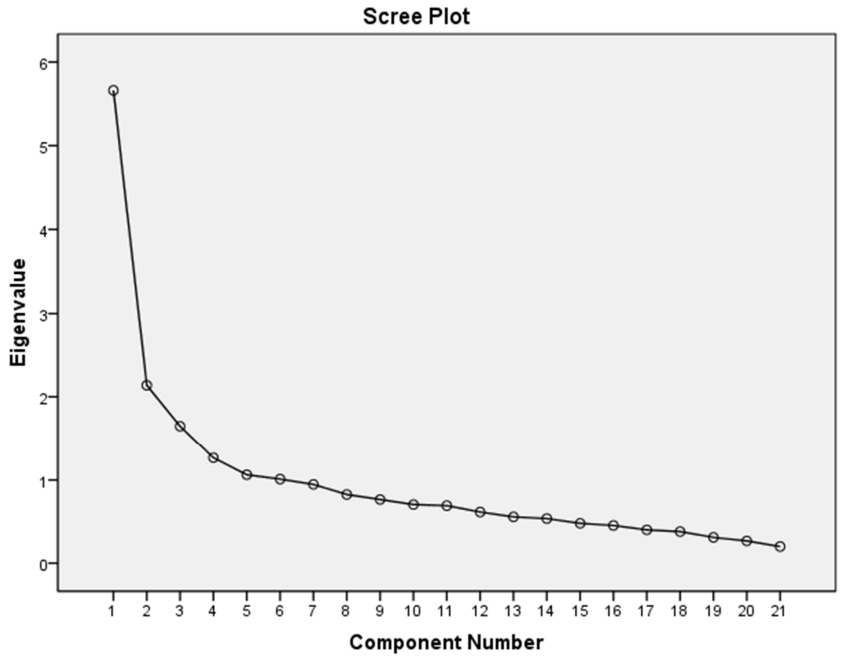
| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 5.664 | 26.970 | 26.970 | 5.664 | 26.970 | 26.970 |
| 2 | 2.136 | 10.173 | 37.143 | 2.136 | 10.173 | 37.143 |
| 3 | 1.648 | 7.849 | 44.992 | 1.648 | 7.849 | 44.992 |
| 4 | 1.266 | 6.027 | 51.019 | 1.266 | 6.027 | 51.019 |
| 5 | 1.063 | 5.063 | 56.082 | 1.063 | 5.063 | 56.082 |
| 6 | 1.011 | 4.814 | 60.896 | 1.011 | 4.814 | 60.896 |
| 7 | .948 | 4.512 | 65.408 | | | |
| 8 | .828 | 3.941 | 69.350 | | | |
| 9 | .768 | 3.658 | 73.008 | | | |
| 10 | .708 | 3.372 | 76.379 | | | |
| 11 | .695 | 3.310 | 79.689 | | | |
| 12 | .619 | 2.948 | 82.637 | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 13 | .562 | 2.675 | 85.312 | | | |
| 14 | .542 | 2.579 | 87.891 | | | |
| 15 | .485 | 2.308 | 90.199 | | | |
| 16 | .460 | 2.188 | 92.388 | | | |
| 17 | .408 | 1.941 | 94.328 | | | |
| 18 | .387 | 1.844 | 96.172 | | | |
| 19 | .318 | 1.514 | 97.686 | | | |
| 20 | .276 | 1.316 | 99.002 | | | |
| 21 | .210 | .998 | 100.000 | | | |

Extraction Method: Principal Components Analysis.

The PCA analysis in Table 4.5 shows 6 components with eigenvalues exceeding 1. Component 1 explains 26.97 of the variance, while component 2, 3, 4, 5, and 6 explain 10.173%, 7.849%, 6.027%, 5.063%, 4.814% of the variance, respectively.

Figure 4.4: Scree plot



In referring to the scree plot, there is a clear break after the 4th component. It was decided to retain four components for further investigation. To aid in the interpretation of these four components, Varimax rotation was performed.

Table 4.6 Table of Components Matrix

| | Component | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| AAC3 | .746 | | | | | |
| AAC4 | .741 | | | | | |
| CAC3 | .649 | | | | | |
| AAC5 | .634 | | | | | |
| AAC6 | .634 | | | | | |
| PAC5 | .596 | | | | | |
| AAC1 | .595 | | | | | |
| AAC2 | .575 | | | | | |
| CAC1 | .548 | | | | | |
| CAC4 | .534 | | | | | |
| CAC6 | .527 | | | | | |
| PAC4 | .496 | | | | | |
| EAC1 | .484 | .460 | | | | |
| PAC2 | .424 | | | | | .409 |
| EAC2 | | .619 | | | | |
| EAC3 | .433 | .531 | | | | |
| EAC4 | .409 | .444 | | .435 | | |
| PAC1 | | .427 | | | | .409 |
| PAC3 | | | .407 | | | |
| CAC5 | | -.402 | | | .448 | |
| CAC2 | | | | | -.422 | |

Extraction Method: Principal Component Analysis.

a. 6 components extracted.

In referring to table 4.6, the output generation does not show a consistent pattern of loading and is not clumped together; therefore, rotation needs to be carried out in order to get the solution to clump together. In the second part of the factor

analysis, the correlation coefficient increased to 0.4, while the KMO value is still above 0.6 and remains at 0.846, and the Bartlett's Test of Sphericity is still in the significant level.

Table 4.7: Varimax Rotation of Four Factor Solution for Consumer Values

| | Component | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| AAC4 | .827 | | | |
| AAC3 | .764 | | | |
| AAC5 | .708 | | | |
| AAC1 | .683 | | | |
| AAC2 | .659 | | | |
| AAC6 | .590 | | | |
| CAC3 | | .776 | | |
| CAC1 | | .729 | | |
| CAC6 | | .680 | | |
| CAC4 | | .535 | | |
| CAC5 | | .419 | | |
| CAC2 | | | | |
| PAC4 | | | .669 | |
| PAC3 | | | .645 | |
| PAC1 | | | .613 | |
| PAC2 | | | .589 | |
| PAC5 | | | .582 | |
| EAC4 | | | | .761 |
| EAC1 | | | | .703 |
| EAC3 | | | | .681 |
| EAC2 | | | | .636 |

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

The rotated solution is presented in Tables 4.7 and 4.8. Four components show strong component and all variables substantially load onto one component. This

four factor solution explained a total of a 51.019% of the variance; Component 1 contributes 17.265%, while Components 2, 3 and 4 contribute 12.433%, 10.755% and 10.566%, respectively. A summary of the variance for the four factor solution for consumer values is shown in table 4.42. The interpretation is consistent with the previous study by Ibtissem, 2010. These four components represent the Altruistic values, Egoistic values, Anthropocentric values and Ecocentric values. This analysis supports the use of the four value items as separate scales.

Table 4.8: Total Variance of Four Factor Solution for Consumer Values After Varimax Rotation

| Component | Rotation Sums of Squared Loadings | | |
|---|---|---|---|
| | Total | % of Variance | Cumulative % |
| 1 | 3.626 | 17.265 | 17.265 |
| 2 | 2.611 | 12.433 | 29.698 |
| 3 | 2.259 | 10.755 | 40.453 |
| 4 | 2.219 | 10.566 | 51.019 |

Extraction Method: Principal Component Analysis.

### 4.6 Correlation Analysis

As the collected samples are normally distributed the parametric statistic technique is used. In order to answer the research questions stated in chapter 1, Pearson's product-moment correlation coefficient method was used to evaluate the correlation between the variables. Several assumptions need to be complied including that the samples are random and from independent observation. As per the previous tests, the samples are reliable and valid. Seven correlation coefficients were tested via Pearson's product-moment correlation and the

significance level for all correlation coefficients was set at the 0.05 level (2-tailed). The strength of the relationship can be determined via the Pearson correlation (r). If the r value is 0, then it indicates no relationship between two variables and if the r value is 1, then it can be interpreted as perfect positive correlation, while if the r value is -1, it can be interpreted as negative correlation. According to the study of Cohen (1988), the r value can interpret the strength of the relationship. Table 4.9 is the guideline for the strength of the relationship. The sign of + or - indicates a positive or negative relationship. The summary for the matrix for correlation of these seven variables is presented in table 4.10

Table 4.9 Guideline of Strength of Correlation

| **r value** | | | **Strength of correlation** |
|---|---|---|---|
| r = 0.10 to 0.29 | Or | r = -0.10 to -0.29 | Small |
| r = 0.30 to 0.49 | Or | r = -0.30 to -0.49 | Medium |
| r = 0.50 to 1.00 | Or | r = -0.50 to -1.00 | Large |

Table 4.10 Pearson's Product – Moment of Correlation Matrix

| | AAC | EAC | PAC | CAC | AC | AR | PR | SU |
|---|---|---|---|---|---|---|---|---|
| AAC | 1 | | | | | | | |
| EAC | .298** | 1 | | | | | | |
| PAC | .355** | .340** | 1 | | | | | |
| CAC | .456** | .163** | .330** | 1 | | | | |
| AC | .472** | .232** | .364** | .452** | 1 | | | |
| AR | .311** | .112* | .104 | .334** | .416** | 1 | | |
| PR | .468** | .265** | .267** | .389** | .649** | .385** | 1 | |
| SU | .391** | .177** | .210** | .209** | .384** | .206** | .429** | 1 |

N= 338. AAC = Altruistic Values; EAC= Egoistic Values; PAC = Anthropocentric Values; CAC=Ecocentric Values; AC = Awareness of Consequences; AR = Attribution of Responsibility; PR = Personal Norms; SU = Actual usage of non-woven bags

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

**H1: Altruistic value is positively related to awareness of the consequences.**

There is a medium strength relationship between the altruistic values and awareness of the consequences and a positive correlation ($r=0.472$, $p<0.01$). The correlation analysis supports that the altruistic values have a significant positive relationship with awareness of consequences, therefore, H1 is supported.

**H2: Egoistic value is positively related to awareness of the consequences.**

There is a weak strength relationship between the egoistic values and awareness of consequences and a positive correlation ($r=0.232$, $p<0.01$). The correlation analysis supports that the egoistic values have a significant positive relationship to awareness of the consequences; therefore, H2 is supported.

**H3: Anthropocentric value is positively related to awareness of the consequences.**

There is a medium strength relationship between the anthropocentric values and the awareness of the consequences and a positive correlation ($r=0.365$, $p<0.01$). The correlation analysis supports that the anthropocentric values have a significant positive relationship with awareness of the consequences; therefore, H3 is supported.

**H4: Ecocentric value is positively related to awareness of the consequences.**

There is a medium strength relationship between the ecocentric values and awareness of the consequences and a positive correlation ($r=0.452$, $p<0.01$). This result shows that the stronger the ecocentric values the more positive the awareness of the consequences. The correlation analysis supports that the ecocentric values have a significant positive relationship with awareness of the consequences; therefore, H4 is supported.

**H5: Awareness of consequences is positively related to attribution of responsibility.**

There is a medium strength relationship between the awareness of the consequences and the attribution of responsibility with a positive correlation ($r=0416$, $p<0.01$). This result shows that the stronger the awareness of the consequences the more positive is the attribution of responsibility. The correlation analysis supports that the awareness of the consequences has a significant positive relationship with the attribution of responsibility; therefore, H5 is supported.

**H6: Attribution of responsibility is positively related to the personal norms**

There is a medium strength relationship between the attribution of responsibility and the personal norms with a positive correlation ($r=0.385$, $p<0.01$). The

correlation analysis supports that the attribution of responsibility has a significant positive relationship to the personal norms; therefore, H6 is supported.

**H7: Personal norm is positively related to the actual consumer use of non-woven bags.**

There is a medium strength relationship between personal norms and the actual behaviour of usage of non-woven bags with a positive correlation ($r=0.429$, $p<0.01$). The correlation analysis supports that personal norms have a significant positive relationship with the actual behaviour of usage of non-woven bags; therefore, H7 is supported.

Overall, this analysis supports and accepts all the hypotheses developed in Chapter 3. The summary of the supported hypotheses is shown in Table 4.11

Tables 4.11 Summary of Status of Hypothesis

| | **Hypothesis** | **Status** |
|---|---|---|
| H1 | Altruistic value is positively related to awareness of the consequences. | Supported |
| H2 | Egoistic value is positively related to awareness of the consequences. | Supported |
| H3 | Anthropocentric value is positively related to awareness of the consequences. | Supported |
| H4 | Ecocentric value is positively related to awareness of the consequences. | Supported |
| H5 | Awareness of consequences is positively related to the attribution of responsibility. | Supported |
| H6 | Attribution of responsibility is positively related to personal norms | Supported |
| H7 | Personal norm is positively related to actual consumer use of non-woven bags. | Supported |

### 4.6 Multiple Regression

Multiple regression is a technique to explore the more sophisticated and complex relationship between one dependent variable and several independent variables. In order to have a better understanding of the relationship between consumer values and actual usage of non-woven bags, the multiple regression method was used to examine the relationship between the independent and dependent variables. The assumptions of multiple regression in this study are that the sample size is big enough, therefore, we use the rule of thumb from Tabachnick and Fiedell (1996) to calculate the sample size required. In referring to the equation, the sample size must be more than 106 cases. As our sample size is 338 it complies with the rules. In addition, there must be no multicollinearity or singularity of the data. In referring to table 4.10, the r values from the correlation analysis show that all the variables are less than 0.9, and, hence, no multicollinearity exists. However, the multiple regression needs to be analysed again to ensure there is no multicollinearity of the data. Assumptions on this analysis are that the samples are normally distributed, the residuals should have a straight-line relationship with the predicted dependent variable, and the variances of the residuals are homoscedastic.

The equation model of the study is presented below:

$$SU = a + \beta_1 AAC + \beta_2 EAC + \beta_3 PAC + \beta_4 CAC + \beta_5 AC + \beta_6 AR + \beta_7 PR$$

Where:

SU = Actual usage on non-woven bags

AAC = Altruistic Values

EAC = Egoistic Values

PAC = Anthropocentric Values

CAC = Ecocentric Values

AC = Awareness of the Consequences

AR = Attribution of Responsibility

PR = Personal Norms

Referring to table 4.12 below, all the variables have a correlation r value of less than 0.09, which indicates that no multicollinearity occurred. According to Tabachnick and Fidell (1996) the independent variables should not have high correlation, and it is suggested that the r value should not exceed 0.7 and if the r value is more than the 0.7, consideration should be given to omitting one of the variables or forming a composite variable from the scores of the two highly correlated variables. From table 4.12, the correlation r value for all the independent variables less than 0.7, this indicates that none of the independent variables are highly correlated and that all the variables should be retained.

Table 4.12 Correlation of Independent and Dependent Variables

| | SU | AAC | EAC | PAC | CAC | AC | AR | PR |
|---|---|---|---|---|---|---|---|---|
| SU | 1.000 | | | | | | | |
| AAC | .391** | 1.000 | | | | | | |
| EAC | .177** | .298** | 1.000 | | | | | |
| PAC | .210** | .355** | .340** | 1.000 | | | | |
| CAC | .209** | .456** | .163** | .330** | 1.000 | | | |
| AC | .384** | .472** | .232** | .364** | .452** | 1.000 | | |
| AR | .206** | .311** | .112 | .104 | .334** | .416** | 1.000 | |
| PR | .429** | .468** | .265** | .267** | .389** | .649** | .385** | 1.000 |

N= 338. AAC = Altruistic Values; EAC= Egoistic Values; PAC = Anthropocentric Values; CAC=Ecocentric Values; AC = Awareness of the Consequences; AR = Attribution of Responsibility; PR = Personal Norms; SU = Actual usage of non-woven bags

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The tolerance values for all the independent and dependent variables in Table 4.13 are calculated from the formula of $1-R^2$. In referring to the tolerance values from table 4.13, the values are not very low or near to zero. This indicates that the multiple correlations with other variables are not high, and, hence, we do not violate the assumption.

Table 4.13 Collinearity of Independent and Dependent Variables

| Model | | Collinearity Statistics | |
|---|---|---|---|
| | | Tolerance | VIF |
| 1 | (Constant) | | |
| | AAC | .634 | 1.577 |
| | EAC | .834 | 1.199 |
| | PAC | .747 | 1.338 |
| | CAC | .684 | 1.461 |
| | AC | .482 | 2.073 |
| | AR | .770 | 1.298 |
| | PR | .526 | 1.900 |

a. Dependent Variable: SU

One of the assumptions for multiple regression analysis is normality, which can be checked from the Normal Probability Plot and Scatterplot.

In referring to Figure 4.5, all the points lie in a reasonably straight diagonal line from bottom left to top right, which indicates no major deviation from normality.

Figure 4.5 Normal Probability Plot of Regression Standardized Residual of Dependent Variable

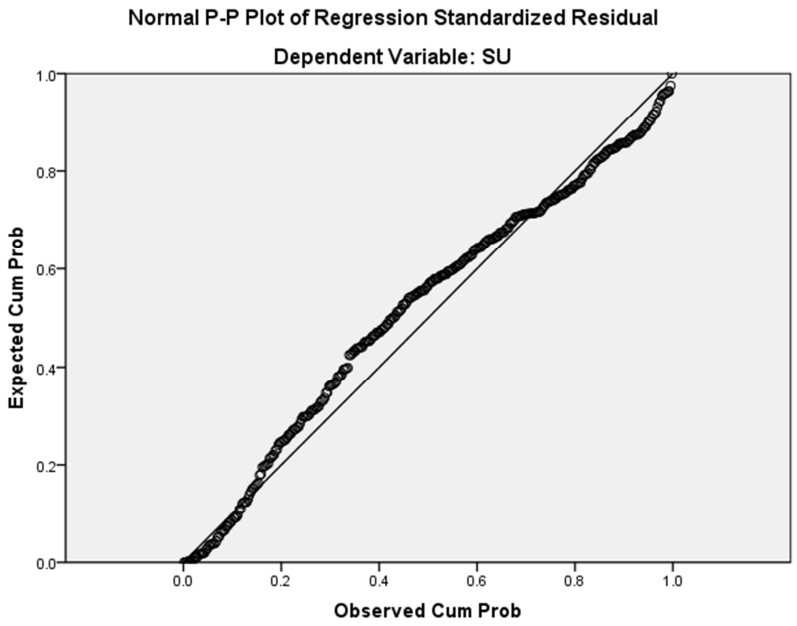
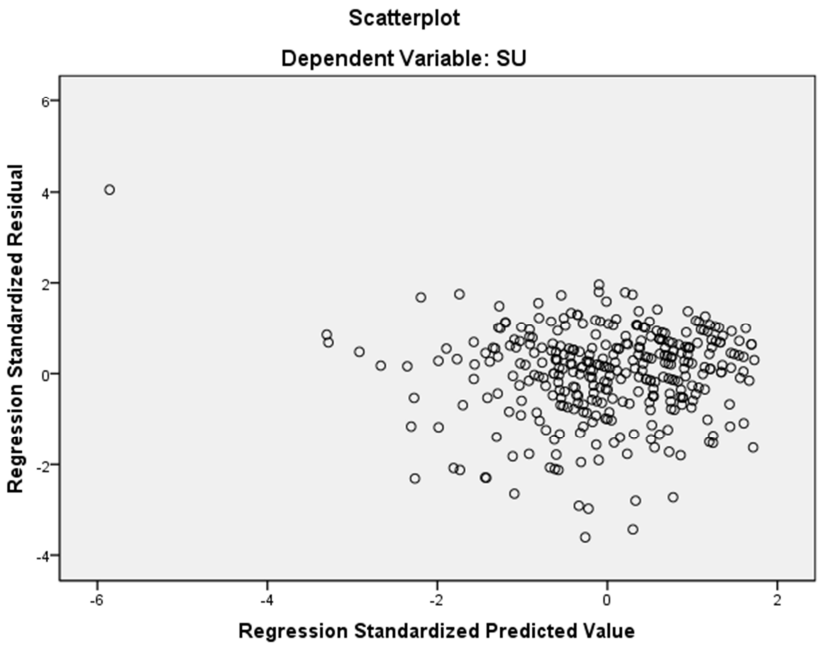



Figure 4.6 Scatterplot of Dependent Variable




In referring to Figure 4.6, the residuals are approximately rectangularly distributed and most of the scores are concentrated around the zero point. Some scores are more than 3.3 or less than -3.3, which indicates that this sample had outliers, however, these were in the acceptable range.

The R Square of this model is 0.242, as shown in Table 4.14, which means that this model explains 24.2% of the variance in consumers using non-woven bags. This analysis is significant, as the significant value in Table 4.15 is zero or $p<0.0005$.

Table 4.14 Coefficient Value of the Model

| R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|
| .492[a] | .242 | .226 | .88631 |

a. Predictors: (Constant), PR, EAC, AR, PAC, CAC, AAC, AC

b. Dependent Variable: SU

Table 4.15 ANOVA Test Results

**ANOVA[b]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 82.651 | 7 | 11.807 | 15.031 | .000[a] |
| | Residual | 259.227 | 330 | .786 | | |
| | Total | 341.879 | 337 | | | |

a. Predictors: (Constant), PR, EAC, AR, PAC, CAC, AAC, AC

b. Dependent Variable: SU

In referring to Table 4.16, the largest standardized coefficient beta is 0.253, which is contributed by personal norms (PR), followed by the altruistic values (AC), which has a beta coefficient of 0.227. This indicates that personal norms have a stronger unique contribution in explaining the dependent variables compared to consumer altruistic values. Both variables make a significant contribution to the prediction of the dependent variable, as the significant value for both variables is less than 0.05. However, other variables have significant values of more than 0.05, which indicate that they do not make a significant unique contribution to the equation. The unstandardized Coefficient B is the beta that will be used in the equation for the model. The B value is an indication to predict the dependent variable values; therefore, only those variables that have a significant value will be entered into the equation. From the findings shown in Table 4.16, the multiple regression equation is as follows:

**SU = 1.594 + 0.299 AAC + 0.244PR**

Where:

SU = Actual usage of non-woven bags

AAC = Altruistic Values

PR = Personal Norms

Table 4.16 Coefficient of Dependent Variable

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1.594 | .491 | | 3.245 | .001 |
| | AAC | .299 | .079 | .227 | 3.765 | .000 |
| | EAC | .013 | .055 | .013 | .242 | .809 |
| | PAC | .034 | .057 | .033 | .601 | .548 |
| | CAC | -.086 | .078 | -.063 | -1.095 | .274 |
| | AC | .147 | .081 | .125 | 1.816 | .070 |
| | AR | .002 | .060 | .002 | .035 | .972 |
| | PR | .244 | .064 | .253 | 3.830 | .000 |

a. Dependent Variable: SU

## 4.7 Summary

The data analysis was presented in this chapter. The chapter started with the descriptive analysis, followed by the preliminary analysis – normality test, reliability test and validity test – to ensure the data were valid and reliable. Correlation analysis was used to test the hypothesis. All hypotheses were accepted. Multiple regression analysis was used to determine which variable was

the most significant and the best predictor to predict the outcome as well as to develop the equation. From the results, only two variables are significant predictors to predict the outcome. The next chapter will discuss the results and propose some recommendations.