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EXPLORING CONSUMER BEHAVIOR TOWARDS ECOLOGICAL FOOD CONSUMPTION

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ABSTRACT: *Consumption of food products is considered to be one of the vital contributors to several environmental problems. This study seeks to explore consumer behavior toward ecological food consumption based on gender, age and education levels in Malaysia and Singapore. This empirical research builds on a survey with a sample of 450 Malaysian and Singaporean consumers. To identify such group difference, two-sample t tests and Wilcoxon rank sum test were performed for analyses. According to the findings, Malaysian female consumers were more willing to adopt ecological food consumption behaviors comparing to males, however; no gender difference was observed in Singapore. Moreover, ANOVA analysis was executed to detect the differences among various age and education level groups. To make a better understanding of the age differences, three categories of age groups were considered in this study, namely Gen Y, Gen X and Baby Boomers. The results reveal that there are no differences between age groups in Malaysia while it is a significant factor among Singaporean consumers. Additionally, education does not play a significant role on consumers' choice of green food neither in Malaysia nor in Singapore. The findings suggest that governments should institutionalize green policies for encouraging companies and enterprises in food industry such as providing incentives for producers of green food products. Governments should also increase people knowledge through raising campaigns to promote public awareness about ecological food. Additionally, marketers should incorporate appropriate strategies to enter the available green markets in Malaysia and Singapore.*

Keywords: Green food, Consumer behavior, Sustainable consumption, Environmental friendly behavior, Demographic

INTRODUCTION

Environmental issues are apparently increasing concerns among advanced economies. Human population growth and the purchase of non-environmental friendly products are known to have an adverse impact on ecological problems. In advanced economies, however; environmental issues have received increasing attending among customers and thus influenced their purchasing behavior. We have witnessed some positive developments such as more consumers nowadays, have higher willingness to adopt ecological behavior and purchase green products. Prior studies in Western countries including the United States and European countries have shown such positive development [1,2,3, 4, 5]. In general, consumers nowadays, have growing awareness about environmental friendly products such as green consumption in advanced economies [6,4]. Green consumption is slowly gaining attention among consumers in Asian emerging economies, too [7]. International green marketers view Asian emerging economies as the new markets since consumers are becoming more conscious to the environmental problems [8, 9]. This is due to the fact that in these countries consumers have higher purchasing power and a willingness to spend more for green products as a result of fast-growing economies in Asia [10].

Assuming that some consumers behave in a more ecofriendly manner, it is necessary to depict this group of consumers in order to follow the selective marketing recommendations [11, 12, 1]. According to Laroche, Bergeron, and Barbaro-Forleo [4] "the closer we move to an understanding of what causes individuals to pay more for green products, the better marketers will be able to develop strategies specifically targeted at these consumers, p. 504". However, marketers have difficulty to identify the population of consumers who are environmentally friendly [12]. Based on the authors' best knowledge, very little is known about consumers' profiles and green buying behaviors in South East Asia specifically in Malaysia and Singapore. Thus, the knowledge gap has become a crucial challenge for marketers as they have to recognize consumers who are willing to purchase environmentally friendly products. Without adequate information about consumers and markets in Asian countries, international green marketers cannot manage to practice effective market segmentation [13]. Thus, identifying the consumers' profiles who are willing to consume ecological products is deemed important for international green marketers.

The experts in this field of study believe that the effect of demographic characteristic of consumers on their green food consumption behavior is a rarely-explored issue. This can be seen by the fact that there is a lack of study with regard to demographic characteristic of consumers and how such characteristics affect green food consumption in Malaysian and Singaporean markets. Hence, the current study is aimed to complement existing knowledge that concentrate on Western contexts. This study will investigate how gender, age and education level influence the consumers' willingness to adopt ecological food consumption behaviors among consumers in Malaysia and Singapore. This study consequently contributes to the knowledge in the area of environmental consumer ecological food consumption behavior. It is essential for green marketers to segment the market according to levels of green purchasing behaviors and to place ecological product in the right market position. This contributes to better targeting of the green consumer segments.

BACKGROUND

Environmental Issues and Food Consumption

A number of environmental problems which threaten both the human life and the environment have been recognized within last decades. In particular, food consumption in industrial

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countries is considered as one of the major contributors of environmental degradation. Among environmentally significant behaviors; production, trade and consumption of food products are identified as the root causes to numerous environmental issues [14]. Prior research have verified that the processes between food production and food consumption contribute to greenhouse gas emissions, soil erosion, excess wastage and other negative consequences [15, 16, 17]. It is thus crucial to shift individual food consumption patterns towards sustainable consumption.

This study attempts to add knowledge about fostering purchase of ecological food in South-East Asia with a focus on the consumers' profiles in Malaysia and Singapore. In other words, consumers will be examined in terms of their gender, age and education levels in order to identify the determinants of consumers' willingness for shifting towards consumption of ecological food. This leads to the question that how ecological food products may be defined.

The word "green" was mostly used for organically grown food. A large body of research have examined consumers' intention to purchase and consume organic food [18, 19, 20, 21]. It includes some vital features and aspects which affects sustainability, but has been neglected as prior studies focus only on organic food products [22].

Prior studies have attempted to overcome such limitation by examining the environmental effects of food products on the natural resources, and energy consumption on top of the harmful emissions that linked with food production, transportation and packaging. For instance, an analysis of the environmental impacts of food products in Switzerland indicated that the production of vegetables in greenhouse causes more environmental problems in terms of use of energy and resources than the open-air production [16]. Furthermore, the impact of vegetable transported by ship to Europe across the Atlantic is eight times more negative than the impact of domestically grown vegetables.

Hence, green food product can be defined as domestically cultivated, organic grown, seasonal and fresh, and also not wrapped [22]. Similarly Liu [23] suggests that green foods are those foods with good quality and safe for consumption and are concerned with animal treatment. Such foods are considered to be nutritious foods in which are produced by means of standards of sustainable development. Green foods are getting popular because of environmentally friendly characteristics and they are regarded to be healthier and safer to be consummated. This leads to the growing number of green food consumers in the world. Teng, Rezai, Mohamed, and Shamsudin [24] claimed that there is a clear and growing trend in terms of green consumers as well as the supply of green food products in food markets.

Tobler, Visschers, and Siegrist [25] used the term "ecological food" which better portraits the aspects of this category of food products. The study similarly has been done in Switzerland and the findings indicated that consumers generally lack sufficient information and knowledge about the environmental relevance of several ecological food consumption patterns. The concept of ecological food has the similar potential to be popularized among Asian countries including Malaysia and Singapore If consumers increase their awareness on food safety, health, animal welfare and the environment.

Effect of Consumers' Demographic Profiles on Green Consumption

Prior studies on environmental issues have investigated the probable influence of demographic variables on environmental concern. For example, age, educational attainment, and gender have been found to have strong and consistent effects on environmental concern over time and across different surveys [26]. It is important to note that such studies on identifying green consumers were initiated since 1970s. Berkowitz, and Lutterman [27] and Anderson, and Cunningham [28] were among the pioneers of this important issue. Research findings by pioneers revealed the fact that, consumers with higher concerns about the environmental issues were mostly females, highly educated, middle aged and with average social and economic statues. These findings were sometimes supported or rejected by other researchers. Although most findings about the impact of consumers' demographic characteristics are contradictory, but such characteristics clearly exhibit a significant influence on consumers' environmentally conscious behavior [29].

Gender Effect

Gender has a crucial role regarding environmentally conscious consumers [30]. In research on consumer behavior based on demographic variables, a considerable distinction has been observed between the behavior of males and females. In fact, consumers with different gender groups behave differently in their consumption manner. Since 1990, many studies have examined a variety of perspectives regarding the differences between males' and females' behavior. The gender is treated to be a social construct that is intertwined with almost all aspects of human behavior. As consumption has been associated with gender differences, consumer researchers have been examining the impact of gender on their behavior [31]. One of the interesting gaps is the effect of gender on consumers' willingness for consumption of green food which will be examined in the present study.

Zelezny, Chua, and Alrich [32] have found that gender difference could possibly begin at the primary-school age with regard to environmental concern. According to Zelezny, and Bailey [33], theoretical clarifications for gender difference include the socialization of gender role. Socialization theory assumes that women are socialized in order to be more interdependent, sympathetic, nurturing, supportive, and helpful in their roles than men. Thus, women should have a stronger ethic of care for others, including the environmental matters, compared to men [33]. Other researchers have attempted to explain the gender differences in environmental concern by incorporating the theory of value orientation. That is, women generally have stronger biospheric orientations compared to men. Consequently, women tend to focus more on values and emphasize on the environment and the ecosystem [34].

Studies on the environmental concerns with consideration of gender differences show conflicting results. Several studies support the gender differences and indicated that females tend to be more ecologically concerned comparing to men [35,

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36]. Some studies found that females are more sensitive towards environmental issues and have better perception comparing to males, as a result; they more frequently become green consumers, [35, 4, 37, 25]. As argued by Laroche, Bergeron, and Barbaro-Forleo [4], gender influences consumers' willingness to pay more for green products. The study shows that 57% of females are willing to pay more for green products while this percentage is only 40% for males. In fact, the study of the literature shows that most studies have identified females as being more environmentally concerned than males [27, 38, 35], however; the issue is debatable as some studies did not support these findings [39]. The study by Reizenstein, Hills, and Philpot [40] also stated that only men were willing to pay more for controlling of air pollution. Interestingly, [41] found no significant difference between males and females in environmental attitude. Based on the aforementioned literature, the following hypotheses have been proposed:

H1a: Consumers' gender significantly influences their willingness to adopt ecological food consumption behaviors in Malaysia

H1b: Consumers' gender significantly influences their willingness to adopt ecological food consumption behaviors in Singapore.

Age Effect

Social or pro-environmental behaviors can be influenced by consumers' age. The environmental and consumer behavior literature, however; show conflicting results on the effect of age and green consumption. Early research identified the green consumers are generally younger compared to non-green consumers [27, 28, 42]. Yet, this trend has been changing in the last decade and several recent studies identified the green consumer as being older than average [43, 44, 29].

Some studies have stressed that age is negatively correlated with participation in environmental issues, because older people may not live to benefit from the long-term benefits of conserving resources [45]. The study by Diamantopoulos, Schlegelmilch, Rudolf, Sinkovics, and Bohlen [46] shows that it is logical to expect younger consumers to better support environment and have higher acceptance of pro-environmental ideologies comparing to their elders. This would require some critical changes in consumers' traditional habits and values. Furthermore, this can be seen as the solution to environmental problems that have been threatening the existing social order. Hence, younger consumers are more concerned with environmental issues comparing to elderlies [47, 48, 37].

In contradiction of the above concept, some scholars have found that older people show higher levels of green behavior [44, 49]. The findings of the study by Lea, and Worsley [39] confirm that older people are more environmentally conscious and are more willing to behave in an ecofriendly manner. Similarly, prior studies have shown that age is negatively related to intended behavior or intentional commitment [47]. Yet, other studies show that older people show higher levels of green behavior by using similar aforementioned indicator [44, 49]. Given that, it can be concluded such inconsistencies are as a result of lack of resources among younger population. Although young consumers are believed to have higher tendencies to commit more resources to protect the environment, they may not currently have the needed financial security to support environmental movements [47]. Finally, it is noteworthy to point out that some studies found no significant relation between age and consumers' environmental concerns. According to Laroche, Bergeron, and Barbaro-Forleo [4], the age of the respondent and his level of education did not influence the consumers' willingness to pay a higher price for ecologically safe products.

Barber, Taylor, and Strick [1] suggest an age effect based on a cohort effect which results from belonging to a specific generation, such as Gen X or Baby Boomer. The cohort effect refers to attitudinal differences between different age-groups resulting from generational differences in socialization, life experiences and economic conditions. Accordingly, in this study, we will focus on the three main generational groups ,namely Gen Y, Generation X, and Baby Boomers.

As categorized by Burke [50] there are four categories for the age groups. The first age group is Veterans who were born between 1925-1940, the second group is Baby Boomers who born between 1941-1960, third group is called Generation X (Gen X) which includes those born between 1961-1976 and finally the fourth group which is Generation Y (Gen Y) also known as Millennials who were born between 1977-1992. According to Kim, Chang, Lee, and Huh, [51], Gen Y are civic-minded and socially conscious, they are brand loyal, and they are willing to pay more for brands names [52]. Poll [53] similarly claimed that the majority of Generation Y consumers' care about the environment. Based on the aforesaid literature, the following hypotheses have been suggested:

H2a: Consumers' age group significantly influences their willingness to adopt ecological food consumption behaviors in Malaysia

H2b: Consumers' age group significantly influences their willingness to adopt ecological food consumption behaviors in Singapore

Effect of Education Level

In general, there is lack of studies on the effect of education level and consumer behavior. Considering the impact of education on environmental consciousness, some studies reported a significant relationship and suggest that those with higher level of education tend to score higher on all components of the environmental domain. As a result, those with higher education understand the issues, involved more fully, and are totally more concerned about environment [54, 55, 25]. These opinions, though; conflict with the findings of some other studies. Based on the study by Sandahl, and Robertson [43] the environmentally conscious consumers were less educated and had lower income than the average Americans. This brought them to conclude that income and education level are not good predictors of environmental concern or purchase behavior. Similarly, the study by Tanner, Kaiser, and Kast [56] revealed that no educational differences were found for ecological food purchase behaviors in a Switzerland. Thus, the following hypotheses were proposed:

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H3a: Consumers' educational level significantly influences their willingness to adopt ecological food consumption behaviors in Malaysia

H3b: Consumers' educational level significantly influences their willingness to adopt ecological food consumption behaviors in Singapore

METHODOLOGY

The Questionnaire

An empirical research study was conducted using survey questionnaire to collect data from respondents both in Malaysia and in Singapore. The questionnaire comprises of two main parts. The first part is Socio-demographic variables (9 items) which captures respondents' demographic information including their age, gender, marital status, ethnic group, religion, employment status, education level, household income and household size. The age categories were determined by grouping the respondents born between 1941 and 1960 as Baby Boomers, those born between 1961 and 1976 (inclusive) as Generation X, and those born between 1977 and 2000 as Generation Y or (Millennials). The second part consists of eight Items on consumers' willingness to adopt ecological food consumption behaviors such as their willingness to reduce meat consumption or to avoid purchasing food imported by airplanes. The items were adapted from [25, 39]. The questionnaire was pretested with frothy five respondents, and minor revisions were made to the questionnaire according to respondents' feedback and comments. The revision included clearer instruction.

Design of the Study

The respondents were Malaysian and Singaporean consumers. The sampling technique was convenient sampling and respondents were participated in this research voluntarily. The questionnaire was distributed in Kelang Valley in Malaysia and in Singapore in different shopping centers, restaurants, university and in other public areas. In total, 400 questionnaires were distributed in Malaysia and 150 in Singapore. The questionnaire have been distributed and collected using face to face interaction with the respondents which resulted in 91percent and 83 percent response rate in Malaysia and Singapore respectively. The total 450 questionnaires were usable in this study after screening and checking the data.

Due to three different races, the sample in Malaysia includes Malay, Chinese, and Indian respondents with the proportion of 48.6, 41.4, and 10 percent, respectively. In Singapore, the proportion was 57 percent Chinese, 30 percent Malays and 13 percent Indians. The number of respondents and the percentage was selected considering the population and race differences in Malaysia and Singapore. Demographics of respondents presented (Table 1).

DATA ANALYSIS

Statistical analysis was computed using the Statistical Package for Social Sciences (SPSS 20). To measure the frequency for the demographic variables, descriptive statistics were used. Reliability analysis was conducted by using Cronbach's Alpha test to assess the internal consistency of the construct of willingness. This is to ensure that the items of a construct are capable of measuring the same construct independently and to be consistent about the concept being measure. As for reliability measure, it was decided that the reliability should not be lower than 0.5 which is the minimum acceptable level suggested [57]. To confirm the dimensions of the construct and to indicate which items are most appropriate for further analysis, factor analysis was conducted on the constructs. To test the relation between gender and consumers' willingness to adopt ecological food consumption, two-sample t tests and Wilcoxon rank sum test were performed for analyses. This has been done separately on the data collected from Malaysian consumers and the data collected from Singaporeans. To determine the relationship between Malaysian consumers' age groups and their willingness to adopt ecological food consumption behaviors, one way ANOVA has been performed. The same analysis has been done on data from Singaporean consumers. Additionally, to examine the relationship between customers' education level and their willingness to adopt ecological food consumption behaviors in Malaysia, one way ANOVA was conducted. The same analysis was performed on Singaporean consumers' data.

RESULTS

Table 5.1 shows the respondents' demographic profiles. The respondents consist of 40.4% male and 59.6% female in Malaysia and Singapore. This study is purposely targeted more female respondents in Malaysia because women are still take care of household matters and purchase and food consumption decisions [58, 59]. Four categories of age groups were considered in this study according to the age groups break down by [50]. According to the results, 81.7% of the respondents were in the category of Gen Y, 13.3% of the respondents were in the category of Gen X, and the rest which was 4.9% were in the category of Baby Boomers. No respondent from category of Veterans participated in this study. As Malaysia and Singapore are multi-racial countries, three ethnics group namely Malay, Chinese and Indians have been considered to participate in the study. Based on the portion of population in Malaysia, Malays have the largest number of population which follows by Chinese and Indians. According to the results 48.6% of respondents were Malays, 41.4% were Chinese and 10.0% were Indians. In Singapore as the population of Chinese ethnic group is larger than Malays and Indians, the proportion of the respondents includes Chinese 57%, Malay 30.0% and Indian 13%.

In terms of education level, it was concluded that the highest majority of respondents were Bachelor's degree holders (45.8%). This followed by respondents, who were high school graduates (25.1%), Master's degree holders (10.4%), Secondary School (4.7%), associate degree (3.3%), some college credit but less than one year, (3.1%), Doctorate (0.9%), professional degree (0.9%), and no schooling (0.4%).

With regard to occupation and employment status of the respondents, the largest group of respondents was university students (51.1%), which follow by 32% of the respondents from the private sector, (10.2%) government employees, (3.6%) self-employed, 1.6% claimed they were unemployed and 0.7% was retired.

From the monthly income profile, most of the respondents in Malaysia earn a monthly income of RM3000-RM4999 (17.1%), and followed by RM1000-RM2999 (16.2%) which can be considered as middle income group. Another 14.7% and 10.4% of the respondents earned below RM1000 and RM5000-RM6999 respectively. The rest of respondents earned RM7000-RM8999 (6.7%), RM9000-RM11999 (5.6%), and above RM12000 (7.1%) per month which are from high income groups. In Singapore the majority which is 28% earned SGD4000-SGD5999 this followed by SGD1000-SGD1999 (24%), and SGD2000-SGD3999 (20%).

Table 1 Consumers' Demographic Profiles

Demographic Profiles	Categories	Frequency	Percentage
Age	20-24	203	45.1%
	25-29	92	20.4%
	30-34	73	16.2%
	35-39	30	6.7%
	40-44	15	3.3%
	45-49	15	3.3%
	50-69	22	4.9%
	Total	**450**	**100**%
Gender	Male	182	40.4%
	Female	268	59.6%
	Total	**450**	**100**%
Marital Status	Single	322	71.6%
	Married with children	87	19.3%
	Married without children	36	8.0%
	Divorced/ Widowed	5	1.1%
	Total	**450**	**100**%
Nationality	Malaysian	350	77.8%
	Singaporean	100	22.2%
	Total	**450**	**100**%
Ethnics Group	Malaysian Malay	170	48.6%
	Malaysian Chinese	145	41.4%
	Malaysian Indian	35	10.0%
	Total Malaysians	**350**	100%
	Singaporean Malay	30	30.0%
	Singaporean Chinese	57	57.0%
	Singaporean Indian	13	13.0%
	Total Singaporeans	**100**	100%
	Total	**450**	100%
Religion	Muslim	199	44.2%
	Christian	65	14.4%
	Hindu	38	8.4%
	Buddhist	126	28.0%
	Others	22	4.9%
	Total	**450**	**100**%
Occupation	Government employee	46	10.2%
	Private sector employee	146	32.4**%**
	Self-employed	16	3.6**%**
	Unemployed	7	1.6**%**
	A homemaker	2	0.4**%**
	Student	230	51.1**%**
	Retired	3	0.7**%**
	Total	**450**	**100%**
Education	No schooling completed	2	0.4%
	Secondary school	21	4.7**%**
	High school graduate - high school diploma or the equivalent	113	25.1**%**
	Some college credit, but less than 1 year	14	3.1**%**
	1 or more years of college, no degree	24	5.3**%**
	Associate degree	15	3.3**%**
	Bachelor's degree	206	45.8**%**
	Master's degree	47	10.4**%**
	Professional degree	4	0.9**%%**
	Doctorate degree	4	0.9**%**
	Total	**450**	**100%**

Income for Malaysian respondents (in RM)	<RM1000.00	66	14.7%
	RM 1,000—RM 2,999	73	16.2%
	RM 3,000—RM 4,999	77	17.1%
	RM 5,000—RM 6,999	47	10.4%
	RM 7,000—RM 8,999	30	6.7%
	RM 9,000—RM 11,999 >RM12,000	25	5.6%
		32	7.1%
		9	2.0%
Income for Singaporean respondents (in SGD)	<SGD500	4	0.9%
	SGD 500-999	24	5.3%
	SGD1000-1999	20	4.4%
	SGD2000-3999	28	6.2%
	SGD4000-5999	8	1.8%
	SGD6000-7999	7	1.6%
	>SGD8000	**450**	100%
	Total		
Household size	1-3	189	42.0%
	4-6	217	48.2%
	7-9	40	8.9%
	>10	4	0.9%
	Total	**450**	**100%**

Table 2 Reliability Analysis

Construct	Item	Cronbach's Alpha	Cronbach's Alpha if Item Deleted
Willingness to adopt ecological Food consumption	WE1	**0.739**	0.716
	WE2		0.703
	WE3		0.718
	WE4		0.714
	WE5		0.706
	WE6		0.729
	WE7		0.699
	WE8		0.713

Table 3 Group Statistics on Gender in Malaysia

Gender		N	Mean	Std. Deviation	Std. Error mean
WID	Male	123	26.61	4.473	0.403
	Female	227	27.94	4.493	0.298

Table 4 Independent Samples Test on Gender in Malaysia

		Levene's test for Equality of Variance		Test for equality of means						
		f	Sig.	t	df	Sig (2-taild)	Mean Difference	Std. Error Difference	.95% Confidence Interval of the Difference	
									Lower	Upper
WID	Equal variances assumed	0.058	0.810	-2.654	348	0.008	-1.333	0.502	-2.321	-0.345
	Equal variances not assumed			-2.657	251.298	0.008	-1.333	0.502	-2.321	-0.345

Table 5 Test Statistics in Malaysia

	WID
Mann-Whitney U	11709.500
Wilcoxon W	19335.500
Z	-2.497
Asymp.Sig.(2-tailed)	0.013

a.Grouping Variable: Gender

Table 6 Group Statistics on Gender in Singapore

Gender	N	Mean	Std. Deviation	Std. Error mean
WID Male	59	25.27	3.633	0.473
Female	41	24.15	4.258	0.666

Table 7 Independent Samples Test on Gender in Singapore

		Levene's test for Equality of Variance		Test for equality of means						
		f	Sig.	t	df	Sig (2-taild)	Mean Difference	Std. Error Difference	.95% Confidence Interval of the Difference	
									Lower	Upper
WID	Equal variances assumed	0.554	0.459	1.418	98	0.159	1.125	0.793	-0.449	2.699
	Equal variances not assumed			1.378	77.109	0.172	1.125	0.816	-0.500	2.750

Table 8 Test Statistics in Singapore

	WID
Mann-Whitney U	1028.000
Wilcoxon W	1889.000
Z	-1.279
Asymp.Sig.(2-tailed)	0.201

a.Grouping Variable: Gender

Table 9 Descriptive for Age in Malaysia

	N	Mean	Std. Deviation	Std. Error	95% Confidence interval for mean		Minimum	Maximum
					Lower Bound	Upper Bound		
20-24	167	16.57	3.132	.242	16.10	17.05	9	25
25-29	75	16.13	3.387	.391	15.35	16.91	10	25
30-34	53	16.81	3.323	.456	15.90	17.73	7	25
35-39	21	17.19	2.581	.563	16.02	18.37	13	21
40-44	10	17.60	2.675	.846	15.69	19.51	13	22
45-49	10	16.80	2.394	.757	15.09	18.51	13	20
50-69	14	16.57	2.766	.739	14.97	18.17	12	22
Total	350	16.59	3.138	.168	16.26	16.92	7	25

Table 10 Test of Homogeneity Variances

Levene's Statistic	df1	df2	Sig.
.653	6	343	.687

Table 11 ANOVA for Age and Willingness in Malaysia

	Sum of Squares	df	Mean Square	f	Sig.
Between Groups	36.493	6	6.082	.614	.719
Within Groups	3400.261	343	9.913		
Total	3436.754	349			

Table 12 Descriptive for Age in Singapore

	N	Mean	Std. Deviation	Std. Error	95% Confidence interval for mean		Minimum	Maximum
					Lower Bound	Upper Bound		
20-24	36	14.72	2.009	.335	14.04	15.40	11	19
25-29	17	13.06	3.132	.760	11.45	14.67	5	17
30-34	20	15.45	3.086	.690	14.01	16.89	11	22
35-39	9	14.00	3.000	1.000	11.69	16.31	10	20
40-44	5	17.60	1.673	.748	15.52	19.68	15	19
45-49	5	18.20	1.095	.490	16.84	19.56	17	19
50-69	8	15.75	3.882	1.373	12.50	19.00	9	21
Total	100	14.92	2.915	.292	14.34	15.50	5	22

Table 13 Test of Homogeneity Variances

Levene's Statistic	df1	df2	Sig.
2.303	6	93	.041

Table 14 ANOVA for Age and Willingness in Singapore

WID	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	168.747	6	28.124	3.889	.002
Within Groups	672.613	93	7.232		
Total	841.360	99			

Table 15 Descriptive for Education in Malaysia

WID	N	Mean	Std. Deviation	Std. Error	95% Confidence interval for mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Secondary	10	16.40	4.115	1.301	13.46	19.34	11	25
High school graduate	81	16.78	2.650	.294	16.19	17.36	11	23
some college credit but less than one year	10	15.60	3.169	1.002	13.33	17.87	10	20
1 or more years of college ,no degree	21	15.24	3.659	.799	13.57	16.90	9	21
associate degree	10	17.50	1.900	.601	16.14	18.86	15	20
bachelor 's degree	168	16.57	3.133	.242	16.09	17.05	10	25
master 's degree	44	16.93	3.266	.492	15.94	17.92	7	23
professional degree	4	18.50	5.916	2.958	9.09	27.91	13	25
Doctorate degree	2	14.50	6.364	4.500	-42.68	71.68	10	19
Total	350	16.59	3.138	.168	16.26	16.92	7	25

Table 16 Test of Homogeneity Variances

Levene's Statistic	df1	df2	Sig.
2.341	8	341	.018

Table 17 ANOVA for Education and Willingness in Malaysia

WID	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	202.602	8	25.325	1.244	.273
Within Groups	6942.666	341	20.360		
Total	7145.269	349			

Table 18 Descriptive for Education in Singapore

WID	N	Mean	Std. Deviation	Std. Error	95% Confidence interval for mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Secondary	2	15.50	2.121	1.500	-3.56	34.56	14	17
High school graduate	11	15.27	3.379	1.019	13.00	17.54	9	21
some college credit but less than one year	32	15.16	2.579	.456	14.23	16.09	9	22
1 or more years of college ,no degree	4	18.25	1.500	.750	15.86	20.64	17	20
associate degree	3	14.00	2.646	1.528	7.43	20.57	11	16
bachelor 's degree	5	15.00	3.317	1.483	10.88	19.12	10	18
master 's degree	38	14.53	2.993	.486	13.54	15.51	5	19
professional degree	3	14.67	4.041	2.333	4.63	24.71	11	19
Doctorate degree	2	11.00	.000	.000	11.00	11.00	11	11
Total	100	14.92	2.915	.292	14.34	15.50	5	22

Table 19 Test of Homogeneity Variances

Levene's Statistic	df1	df2	Sig.
.733	8	91	.662

Table 20 ANOVA for Education in Singapore

WID	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	87.569	8	10.946	1.321	.243
Within Groups	753.791	91	8.283		
Total	841.360	99			

Reliability analysis was conducted by using Cronbach's Alpha test to assess the internal consistency of the willingness construct. According to the result the reliability estimate of the construct was 0.739 which was considered to be reliable according to the criteria >0.5 mentioned by Kerlinger, and Lee [57]. The reliability analysis was also conducted on each item. (Table 2).

Factor analysis was performed on the construct willingness to determine the extent to which the items show the original variable. In order to check data adequacy and Sphericity the KMO and Bartlett's test was checked. As mentioned by [60], a KMO statistic equal or higher than 0.5 shows that the data is suitable for factor analysis. Therefore, the result of the KMO test in this study is 0.746 indicating that the data is suitable for performing factor analysis. The result of Bartlett's Test of Sphericity also shows the value of $p< 0.05$, thus; it was possible to conduct factor analysis. Factor Analysis on consumers' willingness to adopt ecological food consumption behaviors was performed with the use of PCA, and Varimax rotation. Two factors were extracted by PCA explaining 50.39% percent of the variance. In fact items loaded under the first component are those items directly deal with food

consumption and those loaded on the second components related more to environmental friendliness activities. As the assumption of this study was consumers' willingness to adopt ecological food consumption behaviors only the first factor would be considered and three items which were loaded under the second factor, items 6, 7, and 8 was deleted from further analysis.

To test the relationship between gender and consumers' willingness to adopt ecological food consumption, two-sample t tests and Wilcoxon rank sum test were performed on data on Malaysian consumers and the data on Singaporean consumers separately. Considering the result of independent two sample t test for the data in Malaysia, Levene's test showed a probability of 0.810 which is greater than 0.05, thus it is assumed that the population variances are relatively equal. Considering t-value, df, and two-tailed to determine the differences between males and females in Malaysia, the two-tailed significance for gender indicated that t= -2.657, $p<0.05$, thus; there is a significant difference between the two groups. Considering the mean differences between males and females, the results show greater mean for female respondents. The result of the Wilcoxon rank sum test, also shows the mean rank for females are higher than the mean rank for males with the $p<0.05$. Consequently, it is possible to assume that Malaysian female consumers are more willing to adopt ecological food consumption behaviors comparing to their male counterparts. (H1a accepted). The results are represented below. (Table 3, 4, 5).

To test the relationship between gender and consumers' willingness to adopt ecological food consumption in Singapore two-sample t tests and Wilcoxon rank sum test were conducted. Levene's test displayed a probability of 0.459 which is greater than 0.05, thus it is assumed that the population variances are relatively equal. Considering t-value, df, and two-tailed to determine the differences between males and females in Singapore the two-tailed significance for gender indicated that t = 1.378, $p>0.05$ and, thus; there is no significant difference between the two groups. The result of the Wilcoxon rank sum test shows the mean rank for males are higher than females with the $p>0.05$. Hence, it is possible to include that gender is not a significant indicator of willingness to consume green food in Singapore. (H1b rejected). The results are represented below. (Table 6, 7, 8).

To determine the relationship between Malaysian consumers' age groups and their willingness to adopt ecological food consumption behaviors, one way ANOVA was used. The findings for Levene's test for homogeneity of variance is not significant $p>0.05$. Thus, it is possible to say that the population variances for each group are approximately equal. F= 0.614, P>0.01, so as the p value is not significant as it is 0.719 we can say that there is no significant difference between age groups and their willingness to adopt ecological food consumption in Malaysia. Consequently, the alternative hypothesis (H2a) rejected. (Table, 9, 10, 11).

To determine if there is relationship between Singaporean consumers' age groups and their willingness to adopt ecological food consumption behaviors, one way ANOVA was conducted. According to the results, Levene's test for homogeneity of variance is not significant $p>0.05$. Thus, it is possible to say that the population variances for each group are approximately equal. As F=3.889, $P<0.01$, it can be concluded that at least one or two of the group means is significantly different from the others. In other words, there is a significant difference between group mean. Consequently, the alternative hypothesis (H2b) accepted. (Table 12, 13, 14).

In order to find out about mean differences, there is a need to conduct a post hoc follow-up test to determine which means differ from each other. According to the result of post hoc there is a significant difference between mean of group 25-29 and 40-44 and 45-49. In other words, according to our age group division on the basis of Gen Y, Gen X and Baby Boomers, which was discussed in the descriptive part of this chapter, a significant difference can be found between Gen Y and Gen X in Singapore. According to the result of post hoc test older consumers are more willing to use ecological food than younger consumers.

Thus comparing the analysis of the ANOVA test on the relation between age and consumers' willingness to adopt ecological food consumption behaviors, it is possible to say that age is not significantly influencing people willingness in Malaysia while there is significant difference between different age groups in Singapore regarding their willingness to consume ecological food.

To examine the relationship between customers' education level and their willingness to adopt ecological food consumption behaviors in Malaysia, One Way ANOVA was performed. The Levene's test for homogeneity of variance is not significant $p>0.05$. Thus, it is possible to say that the population variances for each group are approximately equal. As F=1.244, $P>0.01$ and It can be concluded that there is no significant difference between consumers education level and their willingness to consume ecological food. Consequently, the alternative hypothesis (H3a) rejected as there is no significant relationship between consumers' education level and their willingness to adopt ecological food consumption behaviors in Malaysia. (Table, 15, 16, 17).

To investigate the relationship between customers' education level and their willingness to adopt ecological food consumption behaviors in Singapore, One Way ANOVA was used. According to the results, the Levene's test for homogeneity of variance is not significant $p>0.05$. Therefore, it is possible to say that the population variances for each group are approximately equal. As F=1.321, $P>0.01$, thus the alternative hypothesis (H3b) rejected since there is no significant relationship between consumers' education level and their willingness to adopt ecological food consumption behaviors in Singapore. (Table 18, 19, 20).

Comparing the results between the two countries, it is possible to conclude that education level does not have a significant effect on consumers' willingness to adopt ecological consumption behaviors in Malaysia and Singapore.

DISCUSSION AND CONCLUSION

Results of the current study on the differences between male and female consumers and their willingness to consume

ecofriendly food indicated that Malaysian females are more environmentally concern than male consumers in their willingness to consume green food. However, the results of the study for Singaporean consumers revealed no gender difference in this regard. Consequently, the results of the study in the context of Malaysia supports the previous researchers showing that women are more ecologically concern than men, [35, 36, 37, 25] while, the result of gender similarity in Singapore confirms the previous study by [41]. Thus, geographical and cultural differences might be the reason that though Malaysia and Singapore are neighboring countries but differences can be observed regarding people's beliefs and attitudes towards environmental issues and green food consumption.

Considering the differences between age groups and consumers' willingness to consume food in ecofriendly manner, the results indicated no significant difference between different age groups in Malaysia, whereas significant difference could be observed in Singapore. Considering the result of post hoc test, the difference was more obvious between age groups of 25-29 and 40-44 and 45-49, in other words, the difference is clearly notable between Gen Y and Gen X in Singapore. The reason might be that as Gen X included the older generation, they might be more concern about the environmental impact of their activities such as choice of food, or they might have more financial resources to support environmental issues comparing to younger generation. The findings are in line with the previous studies [44, 35, 49, 39, 25, 61-65] confirming the fact that older people are more environmentally conscious and are more willing to behave in an ecofriendly manner than younger consumers.

Findings of the current research on the effect of educational level revealed that, no significant difference was observable between education level and consumers' willingness to adopt ecological food consumption behaviors neither in Malaysia nor in Singapore. The results support the previous study by Tanner, Kaiser, and Kast [56], as they declared no education differences were found for ecological food purchase behaviors in Switzerland, however; conflicting results were found by Schwartz J. and Miller [54] and Tobler, Visschers, and Siegrist [25], claiming that consumers with higher education are more conscious and willing to pay for green products.

IMPLICATION

The governments of Malaysia and Singapore should foster initiation of marketing campaigns to direct at encouraging consumers to extent positive personal practices for the use of ecological food products to their social network including friends and relatives. They should also encourage group collaboration on environmental activities among adult consumers.

Findings of the present study can also provide useful information to private companies and green marketers in food industry to gain more knowledge about consumer behavior in Malaysian and Singaporean promising markets. The present study recommends green marketers in Malaysia to market their products through gender-based market segmentation. Marketers should bear in mind that targeting female market would be more beneficial than male market in Malaysia. Thus, it would not be wise for green marketers to assume that what works best for females would work best for males. As shown in this study, female consumers were more willing to purchase and use ecological food products comparing to males. This could be due to their relational and responsibility orientation, thus; they are good for improving the environmental culture in their social networks. They may also have an influential role on their male counterparts in environmental protection. Therefore, the importance of gender based market segmentation needs to be acknowledged in Malaysia.

The results of the study could be useful for green marketers in Singapore as they can gain knowledge about the readiness of an older generation for purchasing green products. Hence, marketers should target the Gen X population in Singapore as they indicated more willingness in ecological food consumption. This could be due to higher financial power of these consumers and it is wise that marketer could target this market segment to achieve better results.

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