Project Report

On

SUSTAINABLE FASHION AND CONSUMER BUYING BEHAVIOUR

Submitted

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BACHELOR OF SCIENCE

in

MATHEMATICS

by

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CERTIFICATE

This is to certify that the dissertation entitled, **SUSTAINABLE FASHION AND CONSUMER BUYING BEHAVIOUR** is a bonafide record of the work done by Ms. **APARNA C.S** under my guidance in partial fulfillment of the award of the degree of **Bachelor of Science in Mathematics** at St. Teresa's College (Autonomous), Ernakulam affiliated to Mahatma Gandhi University, Kottayam. No part of this work has been submitted for any other degree elsewhere.

Date: 23-02-2023
Place: Ernakulam

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DECLARATION

I hereby declare that the work presented in this project is based on the original work done by me under the guidance of Smt. NEENU SUSAN PAUL , Assistant Professor, Department of Mathematics and Statistics, St. Teresa's College(Autonomous), Ernakulam and has not been included in any other project submitted previously for the award of any degree.

Ernakulam. **APARNA C.S**

Date: 23-02-2023 **AB20AMAT50**

ACKNOWLEDGEMENT

I take this opportunity to express my sincere gratitude towards Smt. NEENU SUSAN PAUL of the Department of Mathematics of St. Teresa's College who encouraged me to carry out this work. Her continuous invaluable and knowledgeable guidance throughout this study helped me to complete the work up to this stage. I will always be thankful to you in this regard. I also express my profound thanks to Smt. ROSMIN RAJU and Smt. BETTY JOSEPH of the Department of Statistics and all those who have indirectly guided and helped me in the completion of this project.

Ernakulam. APARNA C.S

Date:23-02-2023 **AB20AMAT50**

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Chapter 1

INTRODUCTION

Fashion is a reflection of our lives. Since the beginning of humanity, clothing has existed. Initially the garment production was a slow process as it took long time to source the raw materials and the sewing was also done manually. As a result, people cherished their outfits and repaired them as much as possible before tossing them when they were literally rags. After the industrial revolution, majority of the production processes were done through machines and this considerably reduced the production time. The customers have a variety of choices at their fingertips, that too at lowest cost. To keep up with the latest trends, people started buying more and more clothes. These new behavior patterns of consumers have paved the path for fast fashion. Fast fashion was a big success and changed the face of the fashion business. Fast fashion refers to inexpensive, stylish clothing that is replicated immediately from runways to retail outlets to keep up with the latest trends. Because of globalization and technological advancements, fast fashion companies make their products using low-cost materials. But this had a drawback: Garment quality is being declined very easily. As a result, the clothes look faded, irregularly shaped and are worn out immediately. And the trends are changing so fast that the customers are forced to buy more and more clothes. Due to these reasons, the fashion industry has overtaken the oil industry as the second biggest polluter in the world. The amount of waste produced by the textile industry is enormous. Dumped textile waste occupies about 5% of all

landfills in the world. Fast fashion items frequently go through rigorous chemical processes before they reach our hands, which contributes to the approximately 500,000 metric tonnes of microfiber pollution that ends up in the ocean.

Getting rid of our old clothes is becoming more of a problem as we continue to buy new ones. In the past, most people employed land filling and burning as methods to get rid of unwanted clothing. Burning clothing and other materials can result in the production of toxic gases like carbon dioxide, which can have a serious negative impact on both the environment and human health. There are many ways to reduce fashion's impact on the environment such as buy less, buy better quality items, think before throwing out old clothes, go for second hand clothes or opt for sustainable fashion. Redesigning old clothes, making second-hand purchases, reselling them, etc. are ways to reuse and profit from old clothes. Reselling is a very good alternative to reducing waste in the fashion industry. Today's top brands have also introduced their own reselling programs. Consumers are quickly adopting resale options due to their price rather than their sustainability. Second-hand clothing is also a good method to avoid pollution. Second-hand clothing is not only more sustainable but also more affordable than branded ones. It has a huge positive social and environmental impact. Since it reduces the demand for manufacturing new garments. Second hand products and sustainable products are available at the market. Many websites and apps offer all kinds of second-hand options and sustainable products ranging from the cheapest to brand ones.

Sustainable fashion has become one of the most popular trends in the last decade. Sustainable clothes are those garments that are created and produced with consideration of the environmental and social impact that they may have throughout their product life cycle, such as using organic materials, eco-friendly production processes, and recycling. Sustainable fashion creates less waste and reduces CO_2 and other greenhouse gas emissions. Usually, these are sold at higher prices due to the cost of materials and promotions.

Our study aims to investigate the relationship between the attitude of consumers based on their age,gender and place of residence towards sustainable clothing and their concern towards the environment. We have also analyzed various factors that influence the buying behavior of consumers. The Data were collected through an online survey among people of age group 15 to 75. A total of 286 responses were collected and analyzed. Statistical tools used for this study are The Independent Samples T-test, the Chi-square test, and the Proportion test.

1.1 OBJECTIVE

The aim of our study is to analyze the attitude of consumers towards sustainable fashion, based on their age and place of residence. Factors that influence the buying behaviour of a consumer is also examined. In the present study following objectives were considered:-

1.To analyze the method of disposal of old clothes among male and female.

2.To analyze the method of disposal old old clothes among Urban and rural areas.

3. Is there a relationship between the concern towards the environment and age groups.

4. Is there a Relationship between awareness of sustainable fashion and concern towards environment.

5. Is there a relationship between the concern towards the environment and gender.

6. Does the proportion of males and females in awareness of sustainable fashion is the same.

7. Does the proportion of urban and rural in awareness of sustainable fashion is the same.

1.2 DATA SOURCE

The data was collected by conducting an online survey among people of age group 15-75 from both rural and urban areas in Ernakulam district.

1.3 DATA DESCRIPTION

The data is a primary data which included the various factors that influence the customers to buy new clothes depending on their age ,gender, and those who resides in urban and rural areas. Also the awareness of customers about sustainable clothing and their concern towards the environment is also examined. The questionnaire was circulated using Google form.

1.3.1 PRIMARY DATA

Data was collected by circulating a Google form. A Google form containing 12 questions was designed to obtain information from the sample population. The sample of this study include consumers in the age group of 15 to 75. The variables under consideration were: The concern of consumers towards environment while shopping, the attitude of consumers of different age groups and residents toward sustainable fashion, the method adopted by consumers when it comes to the disposal of old garments.

1.4 LITERATURE REVIEW

In 2021, Sofiya Miikulainen [4] had conducted a comparison between the attitude that young finish adults holds towards secondhand clothing and what would make them buy more cloth in secondhand. Buying second hand cloths and selling old cloths in secondhand to the next user, will reduce the unnecessary clothing waste and it is sustainable act towards environment. The study shows that young Finish consumers are

holding positive attitudes towards secondhand clothing and are willing to change their buying habits and buy more secondhand clothes. They found that extending the life of clothing by nine months will reduce carbon,water and waste footprints by 20-30 percent, it reduce the energy used to supply, launder and the disposal of clothing by 20 percent.

A study on Consumer attitudes towards sustainable and eco friendly strategies in fashion was done by Cherry Chong [3] in 2010. The study explores the sustainable issues in the fashion industry and the achievement of sustainable development by putting into application the eco friendly operational strategies as well as sustainable marketing strategies .The study shows that sustainable fashion could increase the marketing share of "green clothes",achieve a higher recycling rate and reduce the impact of pollution . The study pointed firstly that the a sustainable marketing strategy ,which suggests production and promotion with sustainable issues of the re-design solution package has to be put into application. Secondly, in order to increase information credibility and availability ,the research suggests using eco-labels that are required to be standardized in the fashion industries .

In 2021 Ezra Holstvoogd had conducted a study about the Factor that influence The purchase intention of sustainable product relating young consumers in the Netherlands [1]. The aim was to stimulate the sustainable apparel consumption in Netherlands. To obtain data they circulated an online questionnaire among the young consumers in Netherlands. Multiple linear regression and hierarchical linear regression were the methods used for data analysis. Through the study they found enough evidence to statistically prove that attitude, perceived environmental concern, a low aesthetic risk and willingness to pay premium have a positive influence on the purchase intension.

In 2016 Sarmily Sarkar had conducted a study for Consumer Perception and Preference in Bangladesh [2]. The study focused to understand the current situation of eco fashion and its position in the grassroots position in Bangladesh;and what does the local consumer thinks about it and to find out what will be the possible obstacles in the way of

eco fashion to emerge in Bangladesh market. The possible solution for development and the kind of government help which can be expected. They conducted a survey to know their perception. The survey was held in Bangladesh. The survey mainly focused about Eco fashion, what the consumer prefer and their perception. In the studies they point out that the consumers of Bangladesh have lack of knowledge about Eco fashion especially those whose income are low. Consumers are allowing that the price is high for sustainable cloths and will be out of their budget. The study says that this is because of lack of knowledge about sustainable fashion. Lack of knowledge and lack of attention is damaging the possibilities of eco fashion to emerge in Bangladesh fashion sector.

In 2022 [5] Doroteja Mandarić had conducted a study based on the Impact of Fashion Brand Sustainability on Consumer Purchasing Decision. The focus of this exploration was on consumer opinion towards the sustainability of fashion brands and how these opinion impact their purchasing opinions.The study's objective was to determine whether Croatian consumers shared the same attitudes and purchase behaviours as those identified in earlier studies. A study of 263 customers with purchasing power was undertaken to learn more about their perceptions, awareness of and attitude towards sustainability and eco-fashion. Using descriptive statistics and correlation analysis, the data acquired were examined. The findings imply that participants have a favourable viewpoint on fashion businesses' sustainability. There exist a positive correlation between the importance of fashion brand sustainability and consumer's decision. However, consumers rank the sustainability of a fashion brand or product as one of the least important considerations when making a purchase. This could imply that their positive attitude may not always be reflected in their actual purchasing behaviour.

1.5 SIGNIFICANCE OF STUDY

Our study rests in its advocacy of environmentally friendly attire. We made an effort to inform people of their unintended environmental

harm. We check to see if they are familiar with sustainable fashion. Do they dress in eco-friendly materials? Since wearing secondhand clothing is a component of sustainable fashion, the study identifies the characteristics that encourage the use of secondhand clothing as well as those that discourage it. The study examines public concern about the environment. Additionally, their shopping habits, including how frequently they shop and the factors they consider while purchasing clothing.

1.6 LIMITATION OF STUDY

Due to time and other constraints, only 284 people participated in the study. The study is limited to a specific area ,so generalization is not possible.Statistical tests such as The Independent Sample T-test , chi-square test and proportion where only done in the analysis part. Since the answer obtained were the personal choice of the respondents, it is possible that the data may or may not be biased.

Chapter 2

METHODOLOGY

2.1 INDEPENDENT SAMPLE T-TEST

The Independent Sample T Test compares the means of two independent groups to determine whether there is statistical evidence that the associated population means are significantly different. The Independent Samples T Test is a parametric test. This test is also known as the Independent T-Test, Independent Measures T-Test, Independent Two-sample T-Test, Student T Test, Two-Sample T-Test, Uncorrelated Scores T-Test, Unpaired T-Test, and Unrelated T-Test.

The variables used in this test are known as Dependent variable or test variable, Independent variable or grouping variable.

Mathematically, The null hypothesis (H_0) and alternative hypothesis (H_1) of the Independent Samples t Test can be expressed in two different but equivalent ways:

- **H_0: $\mu_1 = \mu_2$ ("the two population means are equal").**
- **H_1: $\mu_1 \neq \mu_2$ ("the two population means are not equal").**
  OR

- **H_0: μ_1 - $\mu_2 = 0$("the difference between the two population means is equal to 0").**
- **H_1: μ_1 - $\mu_2 \neq 0$ ("the difference between the two population means**

is not 0").

where μ_1 and μ_2 are the population means for group 1 and group 2, respectively.

When the two independent samples are assumed to be drawn from populations with unequal variances (i.e., $\sigma_1^2 \neq \sigma_2^2$), the test statistic t is computed as:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} - \frac{s_2^2}{n_2}}}$$

Where,

$\bar{x}_1$**= Mean of first sample**

$\bar{x}_2$ **= Mean of second sample**

n_1 **= Sample size (i.e., number of observations) of the first sample.**

n_2 **= Sample size (i.e., number of observations) of the second sample.**

s_1 **= Standard deviation of first sample**

s_2 **= Standard deviation of second sample**

$$df = \frac{(\frac{s_1^2}{n_1} - \frac{s_2^2}{n_2})^2}{\frac{1}{n_1 - 1}(\frac{s_1^2}{n_1})^2 + \frac{1}{n_2 - 1}(\frac{s_2^2}{n_2})^2}$$

However, since the p-value is just a value, we need to compare it with the critical value α :

(The critical values of a statistical test are the boundaries of the acceptance region of the test.)

p-value greater than α :

Fail to reject the null hypothesis of the statistical test.

p-value less than or equal to α :

Reject the null hypothesis of the statistical test.

The most chosen critical value is α = 0.05. Also, in some cases, α= 0.01 is chosen. Here we choose $\alpha = 0.05$. SPSS software was used to calculate the P value.

2.2 CHI-SQUARE TEST

The Chi-Square test is a statistical test used to compare observed and expected results. The method was developed by Karl Pearson in 1990. The value of the Chi-squared test can be formulated using the formula below:-

$$\chi_c^2 = \frac{(O_i - E_i)^2}{E_i}$$

O - observed value

E - expected value

C - degrees of freedom

Steps:

- **Define your null and alternative hypotheses before collecting your data.**
- **Decide on the α value. This involves deciding the risk you are willing to take of drawing the wrong conclusion. For example, suppose you set α=0.05 when testing for independence. Here, you have decided on a 5% risk of concluding the two variables are independent when in reality they are not.**
- **Check the data for errors.**
- **Check the assumptions for the test.**
- **Perform the test and draw your conclusion.**

The basic idea behind the test is that you compare the actual data values with what would be expected if the null hypothesis is true. The test statistic involves finding the squared difference between actual and expected data values, and dividing that difference by the expected data values. You do this for each data point and add up the values. Then, you compare the test statistic to a theoretical value from the Chi-square distribution. The theoretical value depends on both the alpha value and the degrees of freedom for your data. To calculate the Degree of freedom

DF= no of frequency - no independent constraints in them.

In other terms,

DF= (r-1)(c-1)

Where r= number of rows

C= number of columns

2.3 PROPORTION TEST

A proportion test will assess whether a population sample represents the entire population's true proportion. To be able to use the two-sample z-test, the following conditions must be met:

- **The two populations must be normal or approximately normal.**
- **The two samples must be randomly sampled from the two populations.**
- **The two proportions must be independent.**

If any of the above conditions are not met, the two-sample z-test cannot be used and another test must be selected. The two-sample z-test is advantageous because it does not require any knowledge of the population standard deviation.

There are two steps in conducting a two-sample z-test for proportions.

- **The first step is to calculate the standard error of the difference between the two population proportions.**
- **The second step is to calculate the z-test statistic. This is done by dividing the difference between the two population proportions by the standard error of the difference.**

Once the z-test statistic is calculated, the Z-table can be used to determine whether the two population proportions are different. If the z-statistic is greater than or equal to the critical value or level of significance, then it can be concluded that there is enough evidence that there exists a difference between the two population proportions. And, the null hypothesis can thus be rejected.

The formula for two-sample Z-test for proportions:

$$\mathbf{Z} = \frac{(p_1 - p_2) - (P_1 - P_2)}{\sqrt{p(1-p)(\frac{1}{n_1} + \frac{1}{n_2})}}$$

p_1 **is the proportion of the 1st sample**

p_2 **is the proportion of the 2nd sample**

$\mathbf{n}_1$ **is the number of data samples in the 1st sample**

$\mathbf{n}_2$ **is the number of data samples in the 2nd sample**

Chapter 3

DATA ANALYSIS

3.1 EXPLORATORY DATA ANALYSIS

fig 3.1 shows frequency of purchase of new cloths.

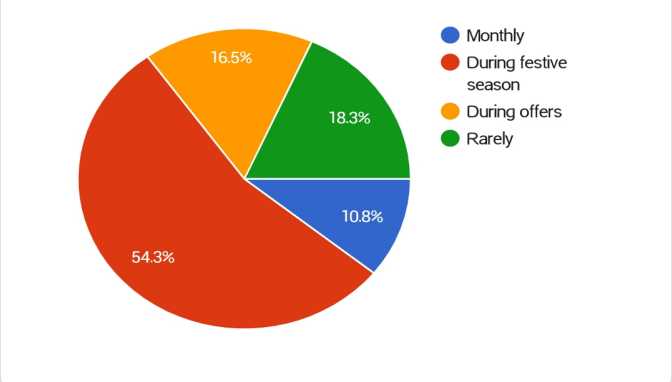


fig 3.2 shows the concern of people about clothing waste effecting environment.

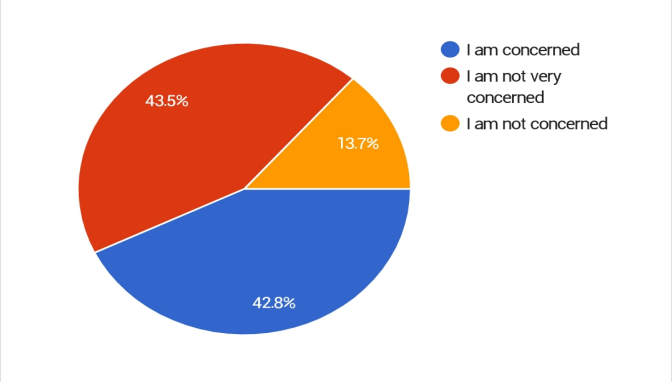


fig 3.3 shows the pie chart of the question " have you heard about sustainable clothing".

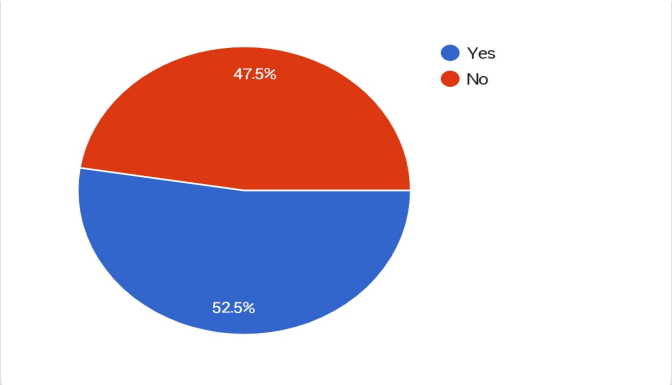


fig 3.4 shows the pie chart of the question "How much of your clothes are purchased in second hand"

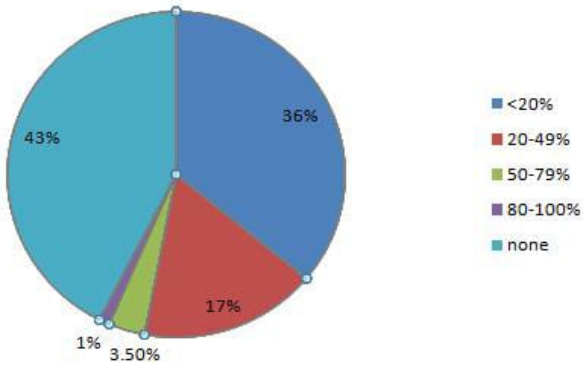


fig 3.5 shows the bar diagram for the question " What is important for you when you purchase your cloths"

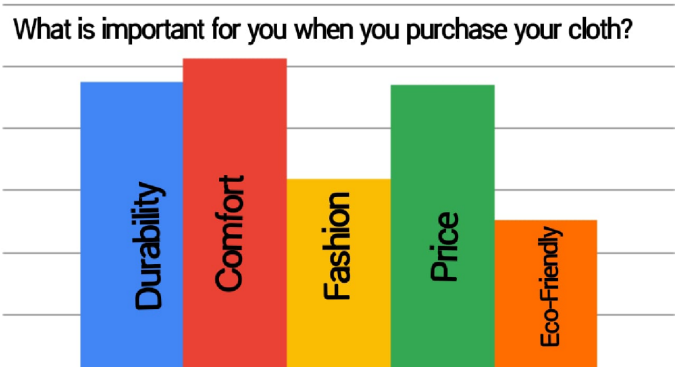


fig 3.6 shows the method of disposal of old cloths by burning method among male and female

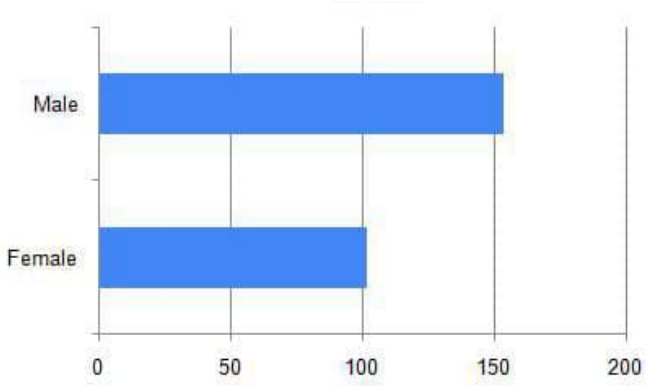


fig 3.7 shows the method of disposal old cloths (donating it to the needy) among urban and rural

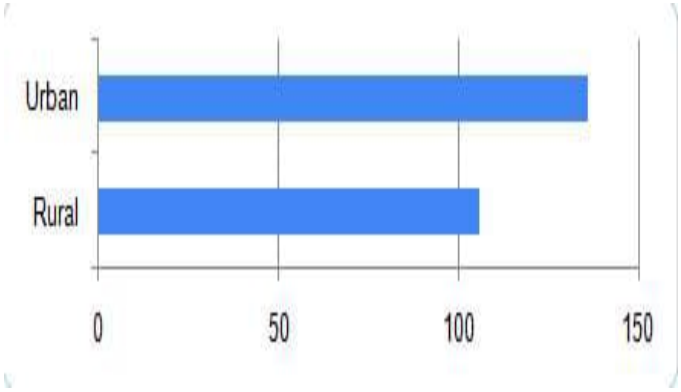
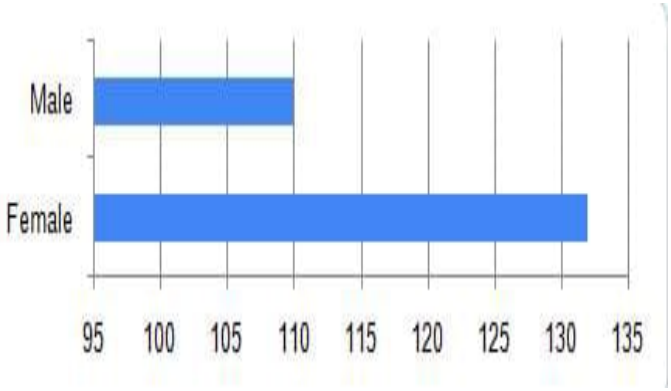


fig 3.8 shows the method of disposal old cloths (donating it to the needy) among male and female.



3.2 CHI-SQUARE TEST

TEST 1

If there exist any relationship between concern towards environment and gender

OBSERVED FREEQUENCY

Gender	I am concerned	I am not very concerned	I am not concerned	Grand Total
Male	61	53	26	140
Female	71	62	11	144
Grand Total	132	115	37	284

H_0: There exist no relationship between Gender and Concern towards environment.

H_1: There exist a relationship between Gender and Concern towards environment.

EXPECTED FREQUENCY

Gender	I am concerned	I am not very concerned	I am not concerned	Grand Total
Male	65.07042254	56.69014	18.23943662	140
Female	66.92957746	58.30986	18.76056338	144
Grand Total	132	115	37	284

P VALUE = 0.023657477

Since p value is less than 0.05, we will reject the null hypothesis. Hence, we can conclude that there exists a relation between Gender and Concern towards environment.

TEST 2

If there exist any relationship between awareness about sustainable fashion and concern towards environment

OBSERVED FREEQUENCY

awareness about 'Sustainable clothing'?	Yes	No	Grand total
I am concerned	98	34	132
I am not very concerned	6	31	37
I am not concerned	58	57	115
Grand total	162	122	284

H_0: There is no relationship between concern towards environment and awareness about sustainable clothing.

H_1: There is relationship between concern towards environment and awareness about sustainable clothing.

EXPECTED FREQUENCY

awareness about 'Sustainable clothing'?	Yes	No	Grand total
I am concerned	75	56.70422535	132
I am not very concerned	21	15.8943662	37
I am not concerned	66	49.40140845	115
Grand total	162	122	284

P VALUE=4.26007×10^{-10}

Since p value is less than 0.05, we will reject the null hypothesis. Hence, we can conclude that there exists a relation between concern towards environment and awareness about sustainable clothing.

TEST 3

If there exist any relationship between concern towards environment and age groups.

OBSERVED FREEQUENCY

Age	I am concerned	I am not concerned	I am not very concerned	Grand Total
15-29	58	7	36	101
30-44	43	12	30	85
45-60	28	17	43	88
60-75	3	1	6	10
Grand Total	132	37	115	284

H_0: There is no relationship between age and concern towards environment.

H_1: There is relationship between age and concern towards environment.

EXPECTED FREQUENCY

Age	I am concerned	I am not concerned	I am not very concerned	Grand Total
15-29	46.94366197	13.1584507	40.89788732	101
30-44	39.50704225	11.07394366	34.41901408	85
45-60	0.90140845	11.46478873	35.63380282	88
60-70	4.647887324	1.302816901	4.049295775	10
Grand Total	132	37	115	284

P VALUE = 0.009713526

Since p value is less than 0.05, we will reject the null hypothesis. Hence, we can conclude that there exists a relation between age and concern towards environment.

3.3 INDEPENDENT SAMPLE T-TEST

Group 1: Male

Group 2: female

H_0**: There is no difference in the method of disposal of old clothes between the two groups**

H_1**:There is difference in the method of disposal of old clothes between the two groups**

GENDER	n	Mean	Std.Deviation	Std.Error Mean
Group 1	140	1.0014	.35462	.02997
Group 2	145	.8428	.34009	.02824

	T-test for Equality of Mean				
	t	df	Sig.(2-tailed)	Mean difference	Std.Error difference
AVERAGE	3.856	283	.000	.15867	.04115

Since p value is less than 0.05, we reject the null hypothesis and conclude that, there is difference in the method of disposal of old clothes between the two groups.

Group 1: Urban

Group 2: Rural

H_0**: There is no difference in the method of disposal of old clothes between the two groups.**

H_1**: There is difference in the method of disposal of old clothes between the two groups.**

RESIDENCE	n	Mean	Std.Deviation	Std.Error Mean
Group 1	148	.8527	.35253	.02898
Group 2	137	.7028	.35865	.03064

	T-test for Equality of Mean				
	t	df	Sig.(2-tailed)	Mean difference	Std.Error difference
AVERAGE	3.557	283	.000	.14993	.04215

Since p value is less than 0.05, we reject the null hypothesis. Hence, we can conclude that there is a difference in the method of disposal of old clothes between the two groups.

3.4 PROPORTION TEST

TEST 1

H_0**: proportion of people who are aware about sustainable clothing among male and female are the same**

H_1**:proportion of people who are not aware about sustainable clothing among male and female are not the same**

n_1**= 144**

n_2**= 140**

p_1**=94/144 = 0.652**

p_2**= 68/140= 0.485**

$$\mathbf{p=}\ \frac{(n_1)(p_1)+(n_2)(p_2)}{n_1+n_2}$$

$$\mathbf{p=}\ \frac{(144)(0.652)+(140)(0.485))}{144+140}$$

p=0.57003

$$\mathbf{Z}\ =\ \frac{(p_1-p_2)-(P_1-P_2)}{\sqrt{p(1-p)(\frac{1}{n_1}+\frac{1}{n_2})}}$$

$$\mathbf{Z}\ =\ \frac{(0.652-0.485)-0}{\sqrt{(0.570.43)(\frac{1}{144}+\frac{1}{140})}}$$

Z = 5.782

Test statistic= 5.782

Since 5.782 lies in the critical region we reject H_0 and conclude that the proportion of people who are aware about sustainable clothing among male and female are not the same.

TEST 2

H_0: proportion of people who are aware about sustainable clothing among urban and rural are the same.

H_1:proportion of people who are aware about sustainable clothing among urban and rural are not the same

n_1 = 147

n_2=137

p_1 = 0.6054

p_2= 0.5255

$$\mathbf{p=}\ \frac{(n_1)(p_1)+(n_2)(p_2)}{n_1+n_2}$$

$$\mathbf{p=}\ \frac{(147)(0.6054)+(137)(0.5255))}{147+137}$$

p= 0.5668

q= 0.4332

$$\mathbf{Z}\ =\ \frac{(p_1-p_2)-(P_1-P_2)}{\sqrt{pq(\frac{1}{n_1}+\frac{1}{n_2})}}$$

$$\mathbf{Z}\ =\ \frac{(0.6054-0.5255)-0}{\sqrt{(0.5668)(0.4332)(\frac{1}{147}+\frac{1}{137})}}$$

Z = 2.74

Test statistic=2.74

Since 2.74 lies in the critical region we reject H_0 and conclude that proportion of people who are aware about sustainable clothing among

urban and rural are not the same

Chapter 4

RESULTS AND CONCLUSION

4.1 FINDINGS

53.2% of the respondents in the research are male,and 46.8% are female. Approximately 50.4% of responses come from urban areas and 49.6% from rural ones. The majority of the 284 sample members are within the 15000-30000 income range.

Only 10.8% of respondents overall said they bought clothes on a regular basis, while 54.3% said they bought clothes for only special occasions. Our analysis indicates that the primary motivation for buying used clothing is because of its affordability.People avoid purchasing used clothing since it is often ruined.

We have determined from the statistics that whether a textile is eco-friendly or not is the least significant consideration while buying clothes.

From the independent Samples T-Test, we could say that the method of disposal of old clothes among male and female are not the same.And also the method of disposal of old clothes among the urban and rural people are different.

We can conclude from the Chi-square test that women are more concerned than men about the environmental impact of garment waste. We can therefore draw the conclusion that there is a connection between gender and concern about how garments waste affect the environment.By proportion test, we could say that the proportion of people who have heard about sustainable fashion is more than those who

haven't heard about sustainable clothing . Proportion of people who have heard about sustainable clothing among female and male are not the same and the proportion of people who have heard about sustainable clothing among urban and rural areas are also not the same .

Even though the majority of individuals claim to be worried about the environmental impact of clothing waste, a significant portion of people still don't use secondhand apparel's.

We discovered through the Chi-square test that there is a connection between age group and environmental concern. We could also observe from the pivot table that people between the ages of 15 and 29 are more worried about the environment.

Additionally, the Chi-square test shows a connection between concern towards environment and awareness about sustainable fashion. Also those in the age range of 15 to 29 are the ones who are more knowledgeable about the sustainable fashion.It demonstrates that the age group most aware of sustainable fashion is also the age group most concerned about the environment.That is, if people are aware of sustainable fashion, they will care more about the environment and take some actions that will help the environment. Environment will be less harmed if sustainable fashion is promoted.

4.2 CONCLUSION

From the study, we can conclude that 57.5% of population are aware about sustainable fashion, 47.5% are not aware about sustainable fashion .From the chi square test, we get the p value 4.26007×10^{-10} which is less than 0.05, that is there exist a statistical relationship between environmental concern and awareness of sustainable fashion . People show a positive attitude on concern towards the environment. 54.3% consumers prefer to purchase clothes during the festive season. The most common method for disposing of old clothes is burning. From the independent Samples T-Test, we get the p value as 0.00 which is less than 0.05 , so we the reject null hypothesis that is, the method of disposal of old clothes among males and females is not the same. Similarly

from the independent Samples T-test we get the p value as 0.00, which is less than 0.05 , so we reject the null hypothesis that is, the method of disposal of old clothes in urban and rural areas are not the same. From the proportion test we found that proportion of people who are aware about sustainable clothing among urban and rural are not the same, also the proportion of people who are aware about sustainable clothing among male and female are not the same. We conducted Chi-Square test, to find whether there exist a relationship between age and concern towards environment. We get the p value as 0.00971 since it is less than 0.05, we rejected the null hypothesis and concluded that there exist a relationship between age and concern towards environment. To find out if there any relationship between the concern towards environment and gender , we conducted the Chi-Square test and it is statistically significant (p value= 0.02365, which is less than 0.05), therefore there exists a relation between gender and concern towards the environment. Therefore the best method to reduce textile waste is to follow sustainable fashion.

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ANNEXURE

Sustainable fashion and consumer buying behaviour

We are students of 3rd year B.Sc. Mathematics of St. Teresa's College (Autonomous) Ernakulam. We are conducting a statistical survey on the topic "**sustainable fashion and buying behaviour of consumers**".
Please go through our project description to answer the questions:
Sustainable fashion (also known as eco-fashion) is an all-inclusive term describing products, processes, activities,aiming to achieve an eco-friendly fashion industry, built on equality, social justice, and ecological integrity. Sustainable fashion concerns more than addressing fashion textiles or products. It addresses the entire process in which clothing is produced, consumed and disposed of; who, what, how, when, where and the expected useful life of the product before entering landfill.

Why is sustainable fashion important?

Sustainable Fashion Creates Less Waste
Sustainable Fashion Reduces CO2 & Other Greenhouse Gases Emission
Sustainable Fashion Saves Water
Please answer the questions.

1. Age *

Your answer

2. Gender *

- ◯ Male
- ◯ Female

3.Place of residence *

- ◯ Urban
- ◯ Rural

4. Monthly Income (If you are not working, your parent's income) *

- ◯ Less than 15000
- ◯ 15000 - 30000
- ◯ 30000 - 60000
- ◯ More than 60000

5. How often do you purchase new clothes? *

- ◯ Monthly
- ◯ During festive season
- ◯ During offers
- ◯ Rarely

6. What is important for you when you purchase your clothes? *

	Always	Sometimes	Never
Durability	○	○	○
Comfort	○	○	○
Fashion	○	○	○
Price	○	○	○
Eco-friendly	○	○	○

This question requires one response per row

7. How do you normally dispose of your old clothes? *

	Always	Sometimes	Never
Donate to the needy	○	○	○
Burning	○	○	○
Recycle / Redesign	○	○	○
Resell/ thrift shopping	○	○	○
Dispose along with other	○	○	○

This question requires one response per row

8. Are you concerned about clothing waste effecting environment? *

- ◯ I am concerned
- ◯ I am not very concerned
- ◯ I am not concerned

9. Have you heard about 'Sustainable clothing'? *

- ◯ Yes
- ◯ No

10. What factors affect your purchasing decision when purchasing **second hand clothes**? *

	Always	Sometimes	Never
low price	◯	◯	◯
good quality	◯	◯	◯
availability	◯	◯	◯
trendy	◯	◯	◯
it's more sustainable option versus buying new clothes	◯	◯	◯

11. What are the factors that stop you from buying secondhand clothes *

	Always	Sometimes	Never
Causes Health issues	○	○	○
unhygienic	○	○	○
Easily get damaged	○	○	○
Less quality	○	○	○

12.How much of your Clothes are purchased in Second Hand? *

- ○ <20%
- ○ 20-49%
- ○ 50-79%
- ○ 80-100%
- ○ I have not purchased second hand cloths

Page 1 of 1

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PAPER PRESENTATION DETAILS

1. **The paper entitled "STUDY ON SUSTAINABLE FASHION AND CONSUMERS BUYING BEHAVIOR " was presented in the National Seminar on 'RECENT ADVANCEMENT IN APPLIED MATHEMATICS ' Organized by the Department of Mathematics, Alphonsa College, Pala on 02 February 2023 ,by Anupama Anilkumar .**
2. **The paper entitled "STUDY ON SUSTAINABLE FASHION AND BUYING BEHAVIOR OF CONSUMERS " was presented in the two - Day National conference on statistical Techniques and practices for Applied statisticians and DATA scientist ,were Organized by the Department of Mathematics and Statistics in Association with Teresian Research and Consultancy Cell (TRAAC) ,St.Teresa's College, Ernakulam From 2 February to 3 February 2023 by Anoopa K.M .**
3. **The paper entitled "STUDY ON ATTITUDE Of COSTUMERS TOWARDS SUSTAINABLE FASHION AND THE INFLUENCE OF ENVIRONMENTAL CONCERN ON CONSUMER BEHAVIOUR "was presented in the Intercollegiate Paper presentation Competition EXEMPLAR 23 held on 21 February 2023 , organized by Research Promotion Council, MES College Marampally ,Aluva ,Kochi ,Kerala,India, by Ann Jacob and Aparna C.S .**

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Consumers in the Two - Day National Conference on Statistical Techniques and Practices for Applied Statisticians and Data Scientists organized by the Department of Mathematics and Statistics in association with Teresian Research and Consultancy Cell (TRAAC), St. Teresa's College (Autonomous), Ernakulam from 2 February to 3 February 2023.

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