Homogeneity & Analysis of Variance: Substantiation among Women Professional Purchase decision of Facial Cream Brands

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Abstract: One way Analysis of Variance (ANOVA) tool established the difference among various groups mean. The study discusses the relationship between demographic variables (Age, Profession, Income, Experience & Occupational sector) and Purchase Decisions of Women Professionals using facial creams. The study categorized women professionals as Advocates, Doctors, Academicians, Engineering & Technocrats, and Administrators & Others. A questionnaire was designed with seven variables like External Stimuli, Internal Stimuli, Brand Awareness, Source credibility, Purchase Intention, Purchase decisions, Purchase experience and was circulated among the women professionals in & around Chennai, a total of 734 questionnaire was composed. These articles confer about the results of the normality test and one way ANOVA using Statistical Package for Social Science SPSS 21.0. This article is framed only to measure whether there is a significant difference among the demographical variables with the only one variable of the study that is purchase decisions. To investigate the assumptions of normality Kolmogorov-Smirnov & Shapiro-Wilk was calculated & multicollinearity tests were conducted. The finding of the study shows that there is a difference among the demographic variables with the purchase decisions of the facial creams among women professionals. This study shall act as a direction for the academician and marketers for better understanding purchase decisions of facial cream brands among women professionals based on the demographic variables.

Keywords: External Stimuli, Internal Stimuli, Purchase decisions, Women Professionals, Purchase Intention, Source credibility, Purchase Experience, Facial Creams.

I. INTRODUCTION

A. Preamble

According to the Grand view research the market share of the facial cream brands is growing day by day globally and the market value in 2015 USD 116.3 billion, the market predicted that there is a rising demand among the Asian countries. Schiffman & Kanuk(2004) declares that decision making is a technique of selecting two or more potential options an individual chooses amid purchasing or not to purchase, in this scenario an individual person decides its positions. Ramsethu (2015) stated that the women play a major role in purchase decisions, women sovereign sources of purchasing power has been increased since ages now and they aware of the opportunities and challenges available in the society. Marichamy (2013) refers that the women play a major role in any purchase decisions. A woman in whichever age group adores to refurbish their adolescence and their facial appearance, enormous portion of them have started to apply facial cream brands. Facial cream brands enable our personality as a shielding ailment of skin.

II. Objective of the Study

- To examine the significant difference among the demographic variables like Age, Income, Profession, Experience and Occupational Sector with the purchase decisions among the women professionals using facial cream brands.
- To find out the assumptions of normality and multicollinearity among all the variables like External stimuli, Internal stimuli, Brand Awareness, Source Credibility, Purchase intentions, Purchase decisions, Purchase Experience among women professionals using facial cream brands.

III. Materials & Methods

This is a descriptive study and the sample practice is disproportionate stratified random sampling as inferred by Madhumita (2018). The research instrument used is questionnaire with three diverse parts-Sec A demographic profile, Sec B Influence of facial cream brands to comprehend the buying prototype of consumers & Sec C–Categorised by means of 7 variable they are External stimuli (advertisement, store, promotions & Celebrity endorsement), Internal stimuli (Consumers Attitude & beliefs, Perception & Personality), Brand awareness, Source Credibility, Purchase intentions, Purchase decisions & Purchase experiences. The sample size is 734 and they are classified into stratas like advocates, doctors, academicians, engineers & technocrats, administrators and others. The primary data was collected in and around Chennai. The
statistical investigation was conceded with Statistical Package of Social Science (SPSS 21.0).

IV: Results & Discussions

TESTING THE ASSUMPTION OF NORMALITY

The primary stride in using the One-way ANOVA tool to examine the assumption of normality, here the Null Hypothesis is to understand whether there is no significant difference for each variable & to check the normality among them. Alternative hypothesis indicates the significant difference among the variables so that the rejecting the null hypothesis in the errand of the alternative designate that the assumption of normality have not meet for the specified samples. At this point of study, to check the assumptions the researcher used Kolmogorov-Smirnov and Shapiro-Wilks examined. The Shapiro-Wilks is a statistical examination of the hypothesis that sample data comprised by the normally distributed population. A normal distribution is alleged by numerous statistical measures. They are engaged in the outward appearance of normal bell shaped curve.

**Table No.1 Test for Normality**

| Variables | Kolmogorov-Smirnov Statistic | Shapiro-Wilk Statistic |
|-----------|-----------------------------|------------------------|
| External Stimuli | .099 | .965 |
| Internal Stimuli | .074 | .977 |
| Source Credibility | .102 | .973 |
| Purchase Intention | .080 | .977 |
| Purchase Decisions | .085 | .985 |
| Purchase Experience | .094 | .980 |

Hence from the above table it is proved that there is no multicollinearity as the VIF values are less than 5 (Gujarati & Porter (2009)).

ANOVA

**Relationship between Demographic variables and Purchase Decisions**

One way ANOVA was computed to test the homogeneity of the variance, whether there is a relationship between demographic variables (Age, Income, Profession, and Occupational Sector) with the Purchase Decision. The data were investigated whether there is significant differences existed in the statistical mean scores.

The Analysis of Variance Table 3 (ANOVA) for Purchase Decisions variables tests the following hypothesis

- $H_{a1}$: There is significant difference in the mean values of the purchase decision based on the Age.
- $H_{a2}$: There is significant difference in the mean values of the purchase decision based on the Income.
- $H_{a3}$: There is significant difference in the mean values of the purchase decision based on the Profession.
- $H_{a4}$: There is significant difference in the mean values of the purchase decision based on the Occupational sector.

It consists of tolerance and VIF Factor by means of all the variables. The prominent pair wise correlation subsequently there exist multicollinearity among the variables. If the pair wise correlation exceeds 80%, after that there is serious dilemma of multicollinearity (Gujarati & Porter (2009)). Where $VIF = \frac{1}{1 - r^2}$

**Table No. 2 Multicollinearity Statistics**

| Variables | Collinearity Statistics |
|-----------|-------------------------|
| Tolerance | VIF                     |
| External Stimuli | .674 | 1.484 |
| Internal Stimuli | .565 | 1.771 |
| Brand awareness | .577 | 1.734 |
| Source Credibility | .531 | 1.884 |
| Purchase Intention | .554 | 1.805 |
| Purchase Decision | .718 | 1.393 |

**Source: Compiled by the researcher**

The above table no. 1 shows that the data is profoundly highly significant with p value 0.00 for all the variables. Consequently the data are normally distributed. Thus the assumption of the normality as been met.

Multicollinearity
Table No: 3 Test of Homogeneity of Variances

|        | Levene Statistic | DF1 | DF2 | Sig. |
|--------|------------------|-----|-----|------|
| Age    | 6.100            | 40  | 649 | .000 |
| Profession | 3.534          | 40  | 650 | .000 |
| Experience | 4.265           | 40  | 642 | .000 |
| Income | 7.071            | 40  | 637 | .000 |
| Occupational Sector | 5.656        | 40  | 649 | .000 |

Source: Compiled by the researcher

Table No. 3 demonstrate for the demographic variable AGE the F value for Levene’s test is 6.100 with a significant with a p value of 0.00(<0.001) as the significant value is less than the of 0.05(p<0.05), Null hypothesis is rejected for the assumption of homogeneity of variance and terminate that there is significant difference between the Age and the Purchase decisions.

From the above Table No. 3 shows for the demographic variable PROFESSION the F value for Levene’s test is 3.534 with a significant with a p value of 0.00(< 0.001) as the significant value is less than the of 0.05(p<0.05), Null hypothesis is rejected for the assumption of homogeneity of variance and finish off that there is significant difference between the Profession and the Purchase decisions.

From the above Table No. 3 shows for the demographic variable EXPERIENCE the F value for Levene’s test is 4.265 with a significant with a p value of 0.00(< 0.001) as the significant value is less than the of 0.05(p<0.05), Null hypothesis is rejected for the assumption of homogeneity of variance and end that there is significant difference between the Experience and the Purchase decisions.

From the above Table No. 3 shows for the demographic variable INCOME the F value for Levene’s test is 7.071 with a significant with a p value of 0.00(< 0.001) as the significant value is less than the of 0.05(p<0.05), Null hypothesis is rejected for the assumption of homogeneity of variance and end that there is significant difference between the Income and the Purchase decisions.

From the above Table No. 3 shows for the demographic variable OCCUPATIONAL SECTOR the F value for Levine’s test is 5.656 with a significant with a p value of 0.00(< 0.001) as the significant value is less than the of 0.05(p<0.05), Null hypothesis is rejected for the assumption of homogeneity of variance and end that there is significant difference between the Occupational Sector and the Purchase decisions.

Table No.4 Descriptive Statistics

|        | N   | Mean | Std. Deviation | Minimum | Maximum |
|--------|-----|------|----------------|---------|---------|
| Age    | 734 | 1.63 | 0.652          | 1       | 3       |
| Profession | 734   | 3.49 | 1.608          | 1       | 6       |
| Experience | 734    | 2.54 | 1.139          | 1       | 5       |
| Income | 734 | 2.87 | 1.242          | 1       | 5       |
| Occupational Sector | 734     | 2.40 | 1.021          | 1       | 5       |

Source: Compiled by the researcher

The above Table No4 demonstrates the descriptive statistics. Utmost mean score for professional variable is

Table No: 5. ANOVA Table

|        | Sum of Squares | DF | Mean Square | F     | Sig. |
|--------|----------------|----|-------------|-------|------|
| Age    | Between Groups | 83.951 | 45 | 1.866 | 5.740 | .000 |
|        | Within Groups  | 210.950 | 649 | .325  |       |      |
|        | Total          | 294.901 | 694 |       |       |      |
| Profession | Between Groups | 251.816 | 45 | 5.596 | 2.356 | .000 |
|        | Within Groups  | 1544.114 | 650 | 2.376 |       |      |
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|                     | Total  | Between Groups | Within Groups | Within Groups | Total  |
|---------------------|--------|----------------|---------------|---------------|--------|
| Experience          | 1795.930 | 199.983         | 690.709       | 890.692       | 695    |
|                     |         | 45             | 642           | 687           |        |
|                     |         | 4.444          | 1.076         |               | .000   |
| Income              | 890.692 | 278.314         | 773.294       | 1051.608      | 687    |
|                     |         | 45             | 637           | 682           |        |
|                     |         | 6.185          | 1.214         |               | .000   |
| Occupational sector | 723.194 | 137.651         | 585.543       | 694           |        |
|                     |         | 45             | 649           |               | .002   |
|                     |         | 3.059          | 1.214         |               | .000   |

Source: Compiled by the researcher

On top of Table 5 illustrate clearly that the P- Values for the F-Statistics are lesser than the 0.05, thus rejecting the Null hypothesis. The results indicate that there is difference in all the demographic variables like age, profession, experience, income, occupational sector and purchase decisions at 5% significance level.

V. CONCLUSION

Among all the seven variables in the study, only purchase decision factor was taken using ANOVA with the demographic variables to analyse whether there is difference in their purchase decisions of the facial cream brands among women professionals. The demographic variables like age, income, experience, occupational sector were establish significantly different with purchase decisions variable. Vano, Jurcova & Meszaros (2002), states that the demographic factors therefore influence the population of several study. The demographic variable Age has the highest F factor value compare to other variables, thus proving that it is highly significantly different affecting the purchase decisions variables. The Occupational sector variable is less significantly different affecting the purchase decisions of facial cream.

The outcome of ANOVA results that there is difference in their demographic profile like age, profession, income, experience & occupational sector with the purchase decision of facial cream brands among women professionals. The study clearly depicts that the assumptions of the normality has been met and the data are normally distributed with no mulitcollineriaity among the variables. The results of ANOVA proves that there is a significant difference among the demographic variables does affect the purchase decisions, the study is an realization for the marketers and the researchers to understand the purchase decisions of women professionals for facial cream brands.

Thus concluding that the purchase decisions differ based on the consumers age, income, profession, experience and occupational sector.

Chart 1 ANOVA – Relationship between Age and Purchase Decision

Chart 2 ANOVA – Relationship between Profession and Purchase Decision

Chart 3 ANOVA – Relationship between Experience and Purchase Decision
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