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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 &Technocracts, 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 &muliticollinerity 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.

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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 them 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 adoresto refurbish their adolescence and their facial appearance, enormousportion of them have started to apply facial cream brands. Facial cream brands enable our personality as a shielding ailment of skin. A cream serves as a mode for whitening the skin and adding moisture to protect our skin discussed by PriyankaKawarkhe(2016).Rajini (2017) refers that the women consumers in these days areinclined to use facial cream brands just to enhance their internal stimuli like their attitude & beliefs, perception and their personalities which leads to purchase decisions of facial cream brands. Madhumita(2017) deems that the purchase of a every commodity for women are prejudiced by brand, famous person, advertisement, promotional etc relatively analysing about the components present in the package, price or the genuine effects of the brands.Determined to purchase is a choice where consumers preciselyacquire a brand, this process leads to consumer to purchase a brand or antedates to procure a brand leading tointentions of purchasing.

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 multicollineraity 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 adescriptive 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 appearanceof normal bell shaped curve.

Table No.1 Testfor Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
External Stimuli	.099	734	.000	.965	734	.000
Internal Stimuli	.074	734	.000	.977	734	.000
Source Credibility	.102	734	.000	.973	734	.000
Purchase Intention	.080	734	.000	.977	734	.000
Purchase Decisions	.085	734	.000	.985	734	.000
Purchase Experience	.094	734	.000	.980	734	.000
a. Lilliefors Significance Correction						

Source : Complied by the researcher

The above table no. 1 shows that the data isprofoundly 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

It consists of tolerance and VIF Factor by means of all the variables. The prominent pair wise correlation subsequently there exist multicollinearity amid the variables. If the pair wise correlation exceeds 80%, after that there is serious dilemma of multicollinearity (Gujarati & Porter (2009)). Where $VIF = \frac{1}{1 - r_{23}^{2}}$

Table No. 2 Multicollinerity 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

Hence from the above table it is proved that there is no multicollineraity 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_{1a}:** There is significant difference in the mean values of the purchase decision based on the Age.
- **H_{2b}:** There is significant difference in the mean values of the purchase decision based on the Income.
- **H_{3c}:** There is significant difference in the mean values of the purchase decision based on the Profession.
- **H_{4d}:** There is significant difference in the mean values of the purchase decision based on the Occupational sector.

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 terminate 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 3.49 with 1.608 standard deviation. The lowest mean score is Age variable 1.63 with 0.652 standard deviation.

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		
	Total	1795.930	695			
Experience	Between Groups	199.983	45	4.444	4.131	.000
	Within Groups	690.709	642	1.076		
	Total	890.692	687			
Income	Between Groups	278.314	45	6.185	5.095	.000
	Within Groups	773.294	637	1.214		
	Total	1051.608	682			

Occupational sector	Between Groups	137.651	45	3.059	3.390	.000
	Within Groups	585.543	649	.902		
	Total	723.194	694			

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.

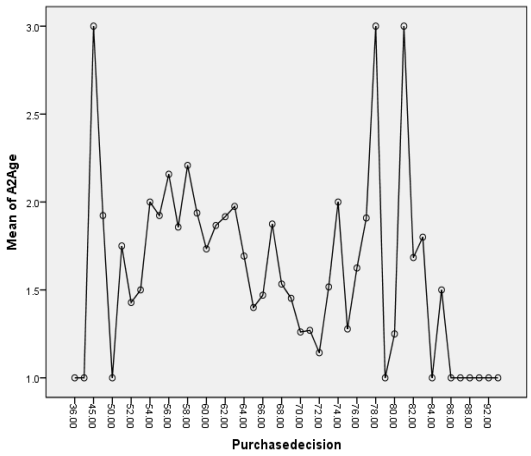
V. CONCULSION

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 it 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 mulitcollineraity 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.

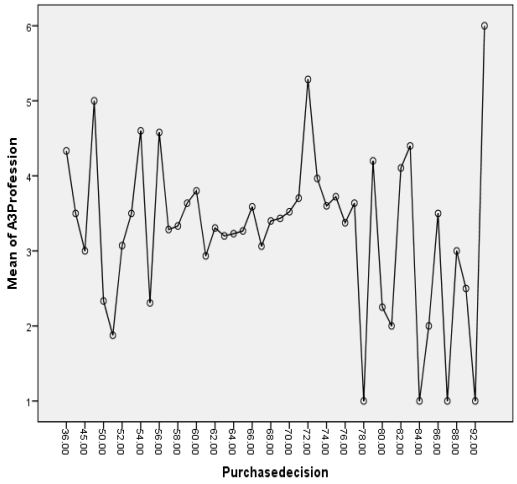
Thus concluding that the purchase decisions differ based on the consumers age, income, profession, experience and occupational sector.

Chart 1 ANOVA – Relationship between Age and Purchase Decision



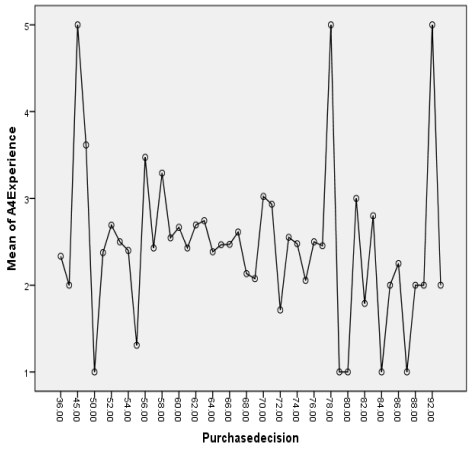
Source: Compiled by the researcher

Chart 2 ANOVA – Relationship between Profession and Purchase Decision



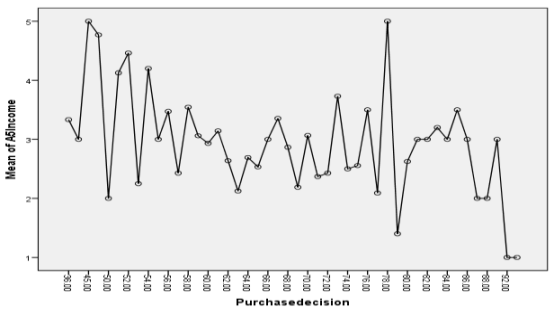
Source: Compiled by the researcher

Chart .3 ANOVA – Relationship between Experience and Purchase Decision



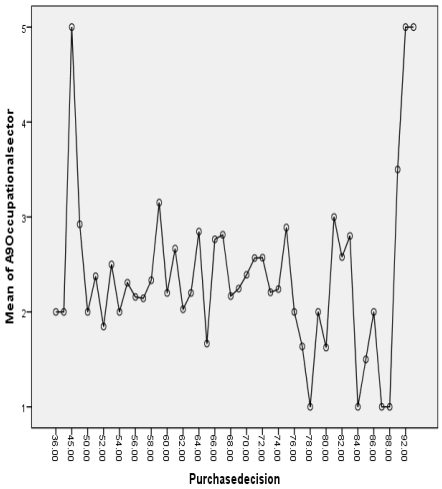
Source: Compiled by the researcher

Chart .4 ANOVA – Relationship between Income and Purchase Decision



Source: Compiled by the researcher

Chart 5.4.5 ANOVA – Relationship between Occupational Sector and Purchase Decision



Source: Compiled by the researcher

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