CHAPTER VIII

COMMODITY PREFERENCES AND INCOME LEVEL

We have already presented evidence that there is some homogeneity in the sample with regard to the hierarchy of preferences among the various commodities. But hierarchy is related to ordering only and does not provide further insight into the magnitudes of allocations made by a typical affluent household on various goods and services. What is the relationship between the preferential system of a consumer and the income level ? What commodities attract increased outlays when income goes up ? Do households at different income levels spend significantly different amounts on a particular commodity ? What goods are luxuries for the affluent group, i.e. have income elasticities greater than unity, implying thereby that as income moves, the proportionate amount spent on the commodity will be larger than the proportionate increase in income ?

Similarly what goods are inferior, with income elasticities less than unity, so that the proportionate change in the commodity expenditure is less than the proportionate change in the income ? The present chapter attempts to provide an answer to some of these questions reserving the estimation of income elasticities to a later chapter.

The technique adopted to investigate the effect of income level was essentially simple. As the sample was large it was partitioned into three sub-samples on the basis of the total household expenditure :

Group I	-	Rs. 650 - 1850	- 79 households
Group II	-	Rs.1850 - 3050	- 70 households
Group III	-	Rs.3050 and over	- 36 households

These groups may be described as less affluent, moderately affluent and highly affluent. A household on the upper extremeity of the range was grouped with the higher income class. Thus a household with Rs. 1850 per month total expenditure was classed as belonging to Group II. This division gave rise to three sub-samples with data on per capita expenditures on the twenty four food items and twentyeight non-food goods and services. Per capita expenditure of the household on each commodity was taken to control for family size to some extent. Taking

one item at a time we could pose the question : did these three samples come from the same population ? If the expenditures on that item in the three sub-samples were not significantly different then one could conclude that income - the basis on which the sub-samples had been partitioned - has had no effect, on the consumption level of the particular commodity. For this purpose appeal to the use of central limit theorem permits the use of difference in means test, pairwise, taking two sub-samples at a time. In the t-test the critical values were chosen for the two-tailed test as a priori there was no reason to assume that the (mean) expenditure of one sub-sample would be less than that of the other. In other words the direction of income effect could not be assumed. The test was applied to all the twenty four food and twenty eight non-food items. Zero responses were ignored to avoid bias. The results are presented in the following paragraphs.

Types of Preferences

Previously we considered the importance which a consumer attaches to a commodity by the place which he assigns to it in the ordering of his preferences. We saw that for the major eighteen commodities there was no significant difference in the ranking between the lower income classes and the higher income classes within this affluent sample of households.

Here we consider the quantitative allocation to each commodity by itself and wish to determine whether income has a positive or negative effect on consumption of the commodity or no effect at all. Analysis using the mean values of lower, middle and high income groups (as defined above) and t-tests show that there is great variation in the preferences of the affluent group and that it is possible to group the commodities into more than two types, (i.e. luxury and necessities) in fact five types. These types reflect the different patterns of consumption behaviour arising when income increases.

The origin of these types is easy to explain. As we go from a lower income level to a higher income level two possibilities are open : the mean may change significantly or it may not and secondly if there is significant difference it may be positive (the higher income group spends more and has a higher mean) or it may be negative (the higher income group spends less and has a lesser mean). In the case where there has been no significant difference it is immaterial whether the mean of the middle income group is higher or lower than that of the lower income group. With three groups the testing of shift in consumption level can be done in three ways, taking groups I and II, II and III and I and III. For each t-test for difference in means, three outcomes are possible :

income effect is positive (+), negative (-) or there is no income effect (0). For different commodities, the pattern of income effect at the successively higher income levels varies. It is possible to group commodities into types on the basis of similarities in income effect.

Type I :

Let us consider the case where the shift from group I to group 2, from group 2 to group 3 and from group 1 to group 3 income have all had significant positive income effect on the means. We may denote these changes in the means symbolically as follows :

$$I \xrightarrow{(+)} II \qquad II \xrightarrow{(+)} III \qquad I \xrightarrow{(+)} III$$

The positive sign indicates that the change in the mean is positive, i.e. along with income the mean expenditure on the commodity increases significantly. In order to clarify the exposition we might take the commodity vegetables which fell under this type.

The means, standard deviations and coefficients of variation of the per capita monthly expenditures of the households in the three income groups were as follows :

	Group I	Group II	Group III
Mean	15.18	19.77	30.56
S.D.	7.773	11.718	23.707
Coefficient of Variation	0.51	0.59	0.78

These figures yielded three values for the standard error of pooled variance between the three groups taken pairwise :

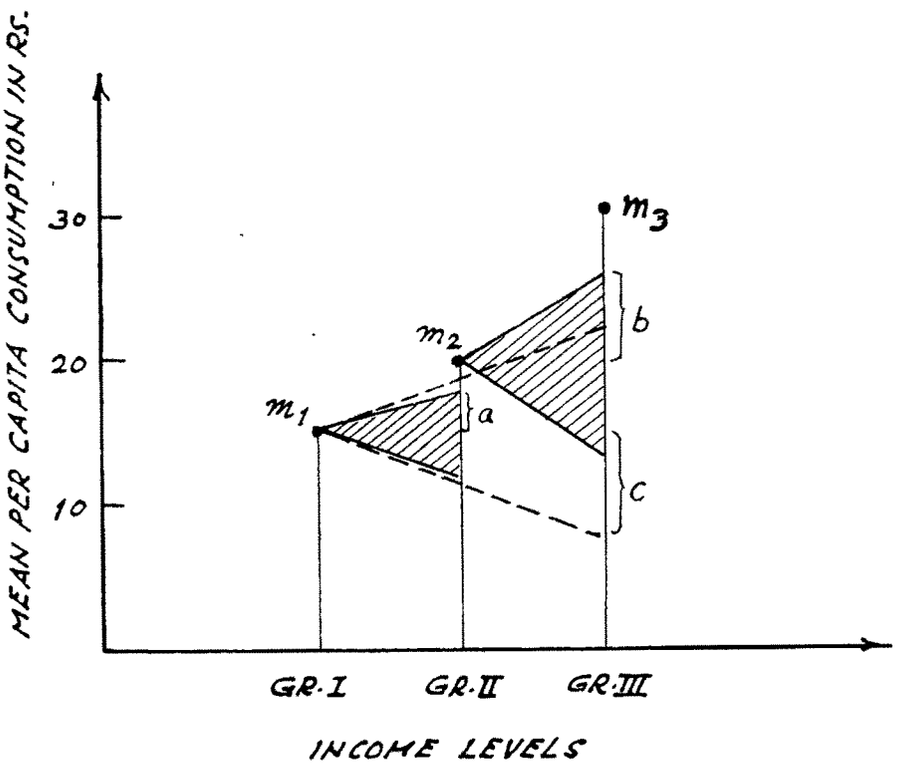
I	and	II	- 1.675
II	and	III	- 3.014
I	and	III	- 3.560

The difference in means test with these standard error of pooled variances gave the t-values 2.74, 3.58 and 4.32 respectively, all of them significant at 0.01 level. Hence for vegetables, income has a positive significant effect as it moves from a lower income group to a higher income group. This is shown graphically in the accompanying figure on p. In the graph No. 8.1, p. 150 , m_1, m_2, m_3 represent the mean expenditures of the three income groups, Gr.I, Gr.II and Gr.III (15.18, 19.77 and 30.56 Rs. respectively). The s.e. of pooled variance between low income group and middle income group is 1.675 and double this width is shown on either side of the mean shaded in the graph to indicate the region of no significance. If the estimated value of the mean of the middle income group had fallen within this band it would have been insignificant (for this value of the standard error). Similarly m_3 (30.56 Rs.) is seen to lie above the zone of insignificance of m_2 (i.e. 19.77 ± (2) (3.014). The zone of the insignificance m_1 with respect to high income group is shown with broken lines. The significance of the

GRAPH: 8·1

MEAN PER CAPITA MONTHLY EXPENDITURE ON VEGETABLES IN Rs. AT THREE INCOME LEVELS

TYPE- I



a = 3·350

b = 6·028

c = 7·120

chree differences implies that as income increases not only does the commodity retain its attraction but in fact attracts more outlay. These would be goods which indicate a high quality of living or alternately have some social prestige value attached to them. The term ' conventional necessities ' is used by Bigelow to indicate those which are purchased by households for their prestige value and he ascribes to these goods a certain ' social survival value. '[1]

In our tests the following commodities and services were found to fall under this type :

Food : Vegetables, Fruits

Non-Food : Electricity, Domestic Servants, Conveyance, and Rent.

Tables, 8.1 (p.170) and 8.2 (p.172) present the related means, standard deviations, coefficients of variation and t-values obtained in the difference in means tests with pooled variance. It may be noticed that the mean values show consistently higher values from the lower to the higher incomes. (The coefficients of variation show however no regular pattern, i.e. the relative clustering of observations of expenditure is irregular). The tests indicate that for the affluent group

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[1] H.F. Bigelow, Family Finance, N.Y. : Lippincott, 1953.

the variable income has positive significant effect over the entire group in their per capita expenditure on these commodities. A consideration of the commodities and services however reveal that different reasons must underlie these preferences. While allocation on vegetables and fruits would reflect the affluent group's concern for health and nutrition in their value system, the outlay on electricity could reflect preference for comforts. The presence of rent in this type implies that there is still social prestige value attached to rent. Western investigators have found that percentage allocation on rent, fuel, housing and lighting is constant for any given social class. (Vide p.29). Our results show that the per capita allocation on rent is significantly different between the different groups. The Engel ratios however for the three income groups are as follows :

	Group 1	Group 2	Group 3
	Rs.	Rs.	Rs.
Exp. on Rent	63.95	111.56	153.00
Total Exp.	423.10	649.30	925.00
Ratio	0.151	0.175	0.163

showing that the percentage allocation is more or less constant. This case exemplifies the fact that Engel ratios alone are not adequate to explain consumption behaviour. It is customary in applied work therefore to consider income

elasticities or total expenditure elasticities as they have been sometimes designated, in conjunction with the Engel ratios.[2] Before discussing this result further it might be advantageous to discuss a closely related type where the moderately affluent and less affluent groups do not show much difference, but the highly affluent group differs significantly from both the moderately affluent and the less affluent group with positive income effect.

Type II : Symbolically this would be

I $\xrightarrow{(M)}$ II II $\xrightarrow{(+)}$ III I $\xrightarrow{(+)}$ III

M : indicates no income effect

These goods compete with the goods of the first type for allocation ; while the high income group allocates significantly more for this than the low and middle income group, the middle income group does not give the same preference which it had given goods of I type. We saw that goods of the first type combine two characteristics, that of being ' conventional necessities ' and having ' prestige value.' The goods of the second type must therefore be lacking slightly in either of these attributes, that is, they are

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[2] Engel himself realized subsequently that the constancy of Engel ratio with respect to rent and clothing was inadequate representation of facts. See Prais and Houthakker, Analysis of Family Budgets, p.79.

not so much of a ' conventional necessity ' or their intrinsic prestige value is less. Commodities which may be termed pure luxuries of conspicuous type could fall in this category.

For Type II we may take clothing as example. The means and standard deviations of the per capita expenditures in the three income groups were :

	Group I	Group II	Group III
	Rs.	Rs.	Rs.
Mean	24.56	31.53	41.06
S.D.	20.611	23.782	29.362
Coefficient of Variation	0.84	0.75	0.71

The standard error of pooled variance for the difference in means tests between the three pairs of sample households were :

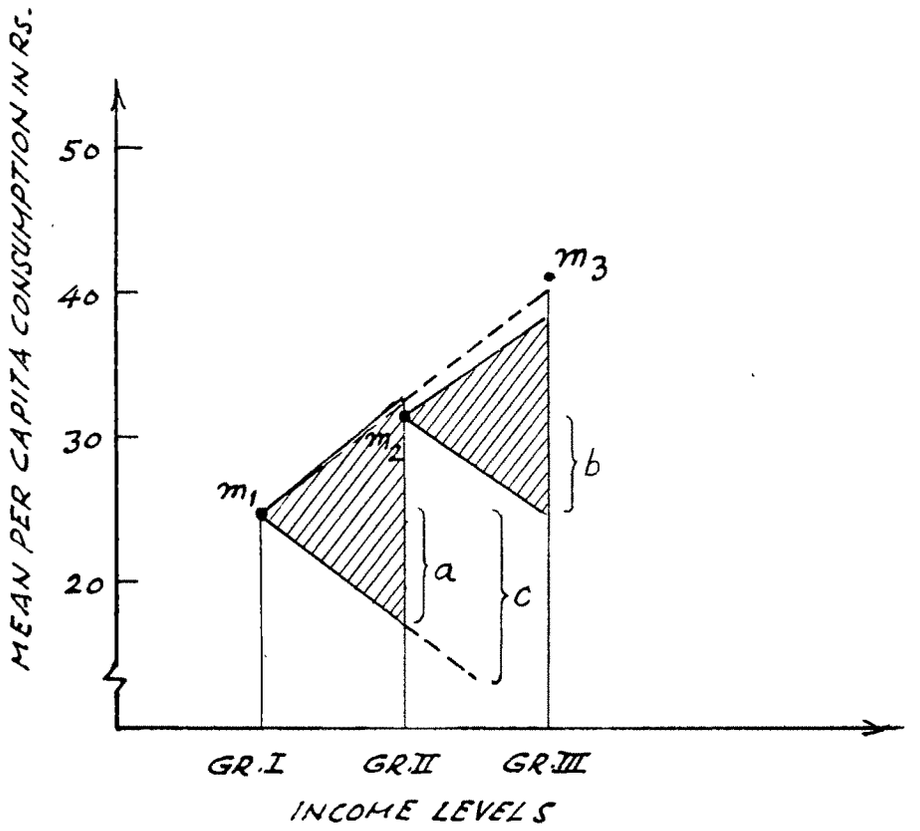
I and II - 3.768
II and III - 3.309
I and III - 8.010

We take as in the previous example twice these values as the width of zone of no significance on either side of the means (giving 95 % level of confidence). (Vide Graph No. 8.2)

GRAPH: 8·2

MEAN PER CAPITA MONTHLY EXPENDITURE ON CLOTHING IN Rs. AT THREE INCOME LEVELS

TYPE - II



$a = 7{\cdot}536$

$b = 6{\cdot}618$

$c = 16{\cdot}020$

The items which fell under this type were :

Food : Spices, Oil

Non-Food : Clothing, Entertainment.

Regarding clothing Sreenivasa Iyengar, Jain and Srinivasan write : ' In relatively affluent countries milk and milk products as well as clothing may fall under the category of necessities while in India they belong to the class of luxuries.'[3] In western studies clothing has been found to be a 'luxury, though a moderate one.'[4] The presence of edible oil under this category is a bit surprising. Could it be that this class of respondents consume more oil on account of throwing more parties.'[5]

The term conspicuous consumption has been used to denote lavish living (e.g. owning two fridges, a fleet of cars).[6] The term is however relative since in an affluent society where every family owns more than one car it is in fact non-ownership of cars that would be conspicuous. In our questionnaire no inventory of durables was asked for except for those

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[3] N. Sreenivasa Iyengar, L.R. Jain and T. Srinivasan, 'Economies of Scale in Household Consumption - A Case Study,' Indian Economic Journal, Vol.XV, No.4, July-Sept.1957, p.

[4] H.S. Houthakker, 'An International Comparison of Household Expenditure Patterns,' Econometrica, Vol.25, 1959, pp.532-551.

[5] NCAER, All India Consumer Expenditure Survey, Vol.2, Pattern of Income and Expenditure, New Delhi, 1967 reported that for edible oil, fuel and lighting, clothing, the p.c. expenditure rises with income.(p.52).

[6] Thorstein Veblen, The Theory of the Leisure Class, London: Macmillan, 1899.

purchased during the year preceding the inquiry. (Vide Chapter X for our findings regarding this item). It would be therefore speculative to discuss conspicuous consumption with regard to our study, but comparing type I and type II, it is perhaps not inappropriate to apply the term pure luxuries to goods of the second category. We may argue that with the moderately affluent group II, of the two opposing forces, the need to restrict expenditure and the capacity to spend, the former triumphs in the case of pure luxuries. The high affluent group having large resources however goes in for more purchase.

Type III :

In this type we consider the case where there is no significant difference between the income group II and income group III, but there is difference between first income group and second income group on the one hand and first income group and third income group on the other. Symbolically this would be :

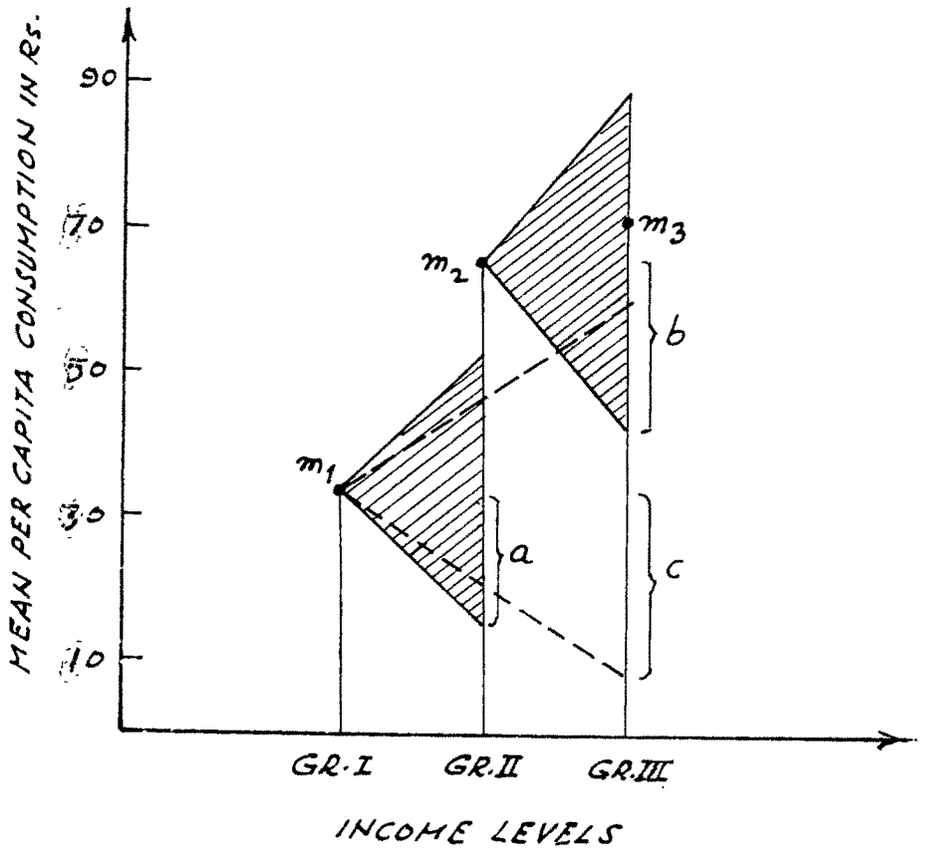
$$I \xrightarrow{(\neq)} II \qquad II \xrightarrow{N} III \qquad I \xrightarrow{(\neq)} III$$

As numerical example we take insurance (vide Graph 8.3) Points m_1 , m_2 , m_3 represent the mean expenditures of the First, Second and Third income groups respectively.

GRAPH: 8·3

MEAN PER CAPITA MONTHLY EXPENDITURE ON INSURANCE IN Rs. AT THREE INCOME LEVELS

TYPE - III



a = 18·432

b = 22·666

c = 25·434

	Group I	Group II	Group III
Mean Rs	33.85	65.46	70.22
S.D.	45.087	62.00	64.607
Coefficient of Variation	1.34	0.95	0.92

The fact that there is a rise in expenditure upto a certain level of income and thereafter there is no significant increase means that a saturation level has been reached. Prais and Houthakker also discuss a satiety level, especially for staple commodities and have tried the hyperbolic form of the Engel curve . However they conclude, ' for most foodstuffs a semi-logarithmic relation gives a 'satisfactory description'.[7] The hyperbola was thus found to be inferior to the semi-logarithmic form, which has noasymptote and thus no satiety level. However one point to be noted is that for fitting Engel curves Prais and Houthakker have taken groups of commodities instead of individual commodities so that even if some commodity had the feature of satiety this might have been lost in the process of aggregation with other commodities. In our case the remarks of Aitchison and Brown seem to apply 'Nevertheless we may reasonably suppose that many commodities begin life as luxuries and eventually become

[7] S.J.Prais and H.S.Houthakker, The Analysis of Family Budgets, p.103.

semi-luxuries or necessities as increasing income and falling prices bring consumer nearer to an ultimate saturation level.'[8]

The commodities which fell under this type in our analysis are :

Food : Nil

Non-Food : Cosmetics, school fees, insurance (Vide Table 8.1, p.170)

It is not unreasonable that insurance shows a saturation level, but the importance ascribed to insurance by the middle income group (moderately affluent) is a little surprising. It seems that notwithstanding the low return on investment the affluent section does value the security afforded by insurance.

Type IV (a) :

In this type the income group III (highly affluent) spends significantly more than the middle income group, but not with respect to the income group I (less affluent). Group I and II do not differ significantly. Symbolically we may represent this as :

$$I \xrightarrow{N} II \qquad II \xrightarrow{(+)} III \qquad I \xrightarrow{N} III$$

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[8] Aitchison and Brown, 'A Synthesis of Engel Curves Theory,' Rev. of Econ. Studies, Vol.XXI, (1) No.57, 1954-55, p.35.

In other words the mean of group II, m_2 , lies within the zone of insignificance of mean of income group I, m_1 ; similarly m_3 , the mean of income group III lies within the zone of insignificance of m_1 , but m_3 lies beyond the zone of insignificance of m_2. As numerical example we have taken post and stationery (Vide Graph 8.4).

	Group I	Group II	Group III
Mean	3.13	3.66	5.69
S.D.	5.729	4.421	5.952
Coefficient of Variation	1.83	1.15	1.46

For such a situation there must be no income effect in the beginning followed by significant positive income effect, but upto a certain limit only. The goods which have come out under this type in our analysis are :

Food : Other cereals, Eating out.

Non-Food : Post and Stationery

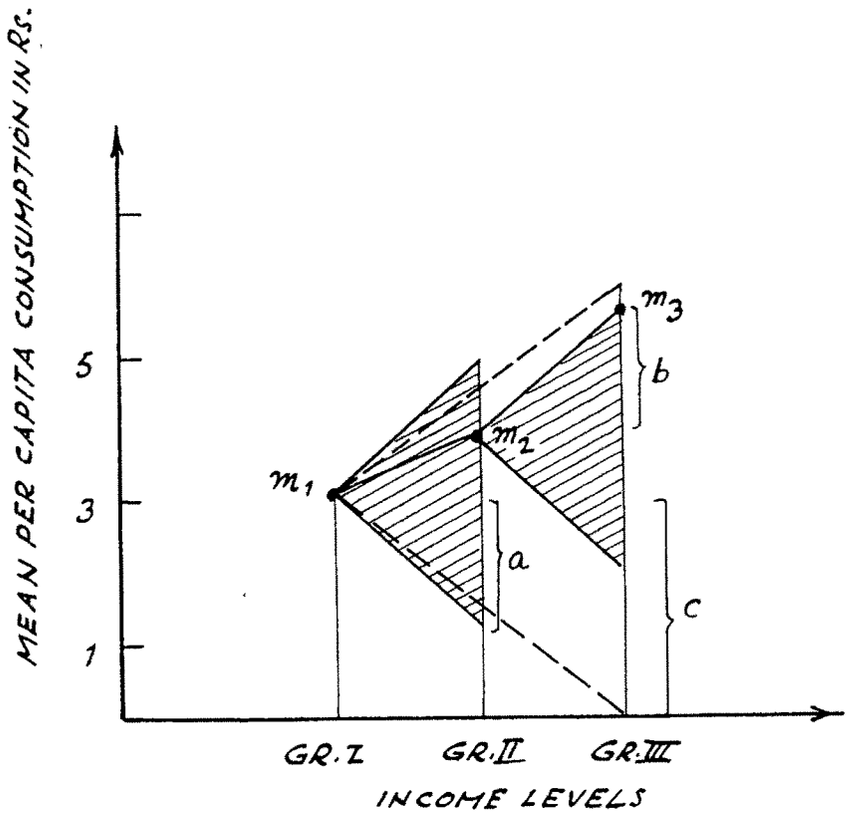
(Vide Table 8.1 , p.171).

Considering the item ' other cereals ' alone, one would be tempted to conclude that the zero income effect in the transition from low income to middle income is due to the fact that other cereals such as jowar have a negative prestige value while at high income level they have no effect at all as far

GRAPH: 8.4

MEAN PER CAPITA MONTHLY EXPENDITURE ON POST & STATIONERY IN Rs. AT THREE INCOME LEVELS

TYPE- IV (a)



$a = 1.780$

$b = 1.802$

$c = 2.828$

as prestige is concerned. But such an interpretation cannot explain the presence of ' eating out ' in this type. Apparently complex factors other than substitutability, complimentarity may play a role in influencing consumer preferences and it will not be possible to interpret all results, unless a penetrating study is made for each item covering not only socio-economic background but also attitudes, values and habits exhibited in actual practice by the households. We now present a few types which we characterise as unusual because only a few commodities fell under the types. The numerical values may be found in Tables 8.1 and 8.2 .

Type IV (b) :

Expenditure rises sharply from income group - I to income group II and then drops so that there is no significant difference between group - II and group - III and between group - I and group - III.

Symbolically ,

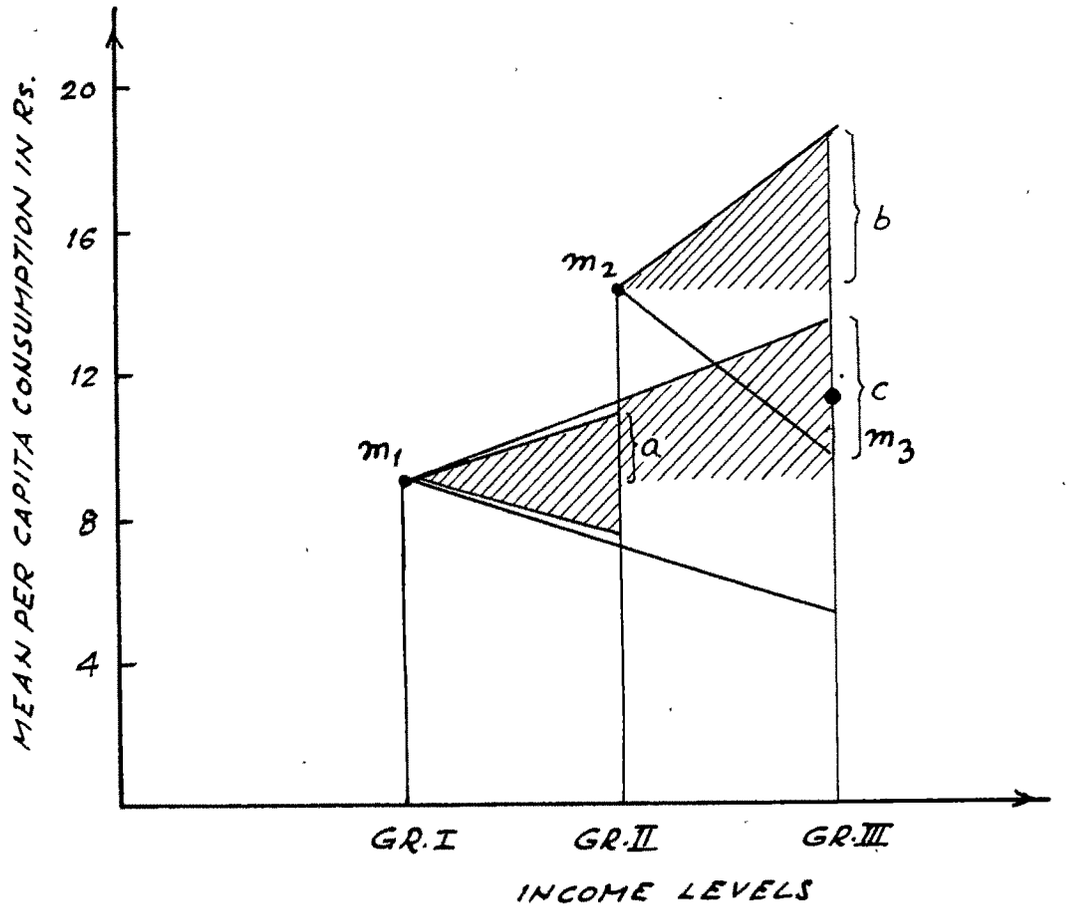
I ——(+)—— II II ——N—— III I ——N—— III

There is initial positive income effect giving way then to negative income effect so that consumption is of the same level for the income group - III as well as for the income group - I. (Vide Graph 8.5).

GRAPH: 8·5

MEAN PER CAPITA MONTHLY EXPENDITURE ON MEDICAL IN Rs. AT THREE INCOME LEVELS

TYPE- IV (b)



a = 4·020

b = 4·680

c = 4·780

Items under this type :

Food	:	Nil
Non-Food	:	Medical

Type IV (c) :

Here we consider a significant rise from income group I to income group III in the mean allocation on individual commodities, without however the intermediary rises being significant, symbolically as : (Vide Graph 8.6)

$$I \overset{N}{\text{———}} II \qquad II \overset{N}{\text{———}} III \qquad I \overset{(c)}{\text{———}} III$$

The expenditure rises slightly from low income to middle income, but is still within the region of non-significence of m_2 ; but the cumulative rise has become sufficiently high for the difference between third and first groups to become significant. These goods are therefore characterised by their limited appeal, however the influence of income is on the positive side. Accordingly their slope, i.e. marginal propensity to consume should be relatively less than in the case of goods of the first or second types.

Items	:	Food	:	Nil
		Non-Food	:	Footwear, vacation and functions

Type IV (d) :

Finally we discuss a case where income group II spends significantly more than income group I but income group III spends significantly less than the income group II. Strong initial positive income effect is replaced by strong negative income effect later, so that the income group III and the income group I, do not differ significantly. (Vide Graph 8.7)

I —(+)— II II —(-)— III I —N— III

Item : Food - dal

We may summarize here the results regarding the income effect on the types of preferences of the effluent households, with family size controlled by taking per capita values. By dividing the sample into three groups, (less affluent, moderately effluent and highly affluent) on the basis of total expenditure for the household and through application of t-tests (pairwise) it has been found that :

(i) The per capita consumption (absolute values in Rs.) of vegetables, fruits, electricity, domestic servants, conveyance and rent rise significantly at each level of income.

(ii) The per capita consumption expenditure on spices, oil, clothing and entertainment rise gradually so that there is significant difference between the high income and low income groups only.

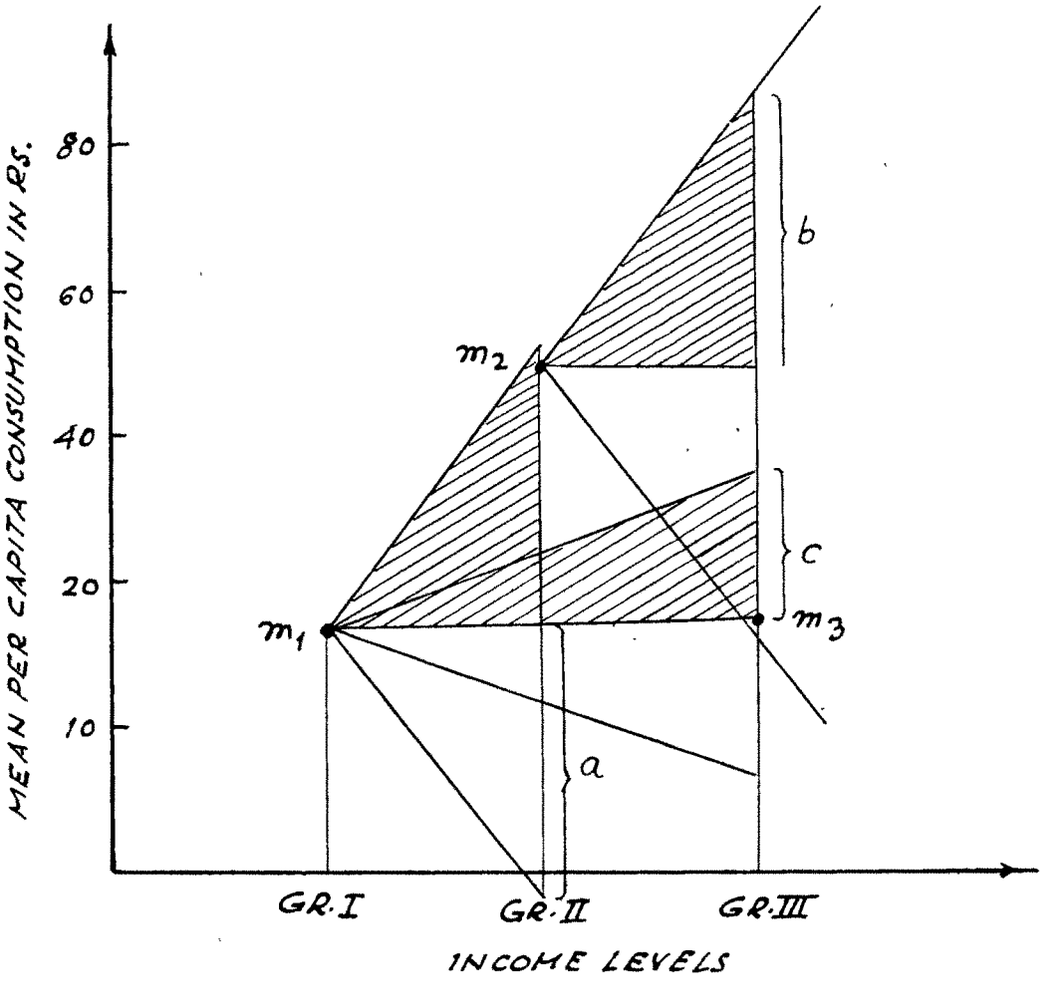
(iii) In the case of cosmetics, school fees, insurance the per capita expenditures rise initially significantly, but thereafter there is no significant difference.

(iv) There are also other types where the variations do not find a ready 'explanation'. In respect of other cereals, eating out and post and stationery the highly affluent income group III spends significantly more than the income group II, but between group I and group III or between group I and group II there is no significant difference. In respect of medical care the only significant difference is between group I and group II. In the case of footwear, vacations and functions there is significant difference between groups I and III only. In the case of dal there is strong initial positive income effect followed by strong negative income effect. The variety of differential movements in consumption level due to income shows complexity in the preferences of the affluent group. Thus the t-tests also confirm the wide disparity of the affluent group in the quantitative allocation of its financial resource, despite homogeneity in the preference ordering of some major basic items.

GRAPH: 8·6

MEAN PER CAPITA MONTHLY EXPENDITURE ON VACATION IN Rs. AT THREE INCOME LEVELS

TYPE- IV (c)



a = 24·180

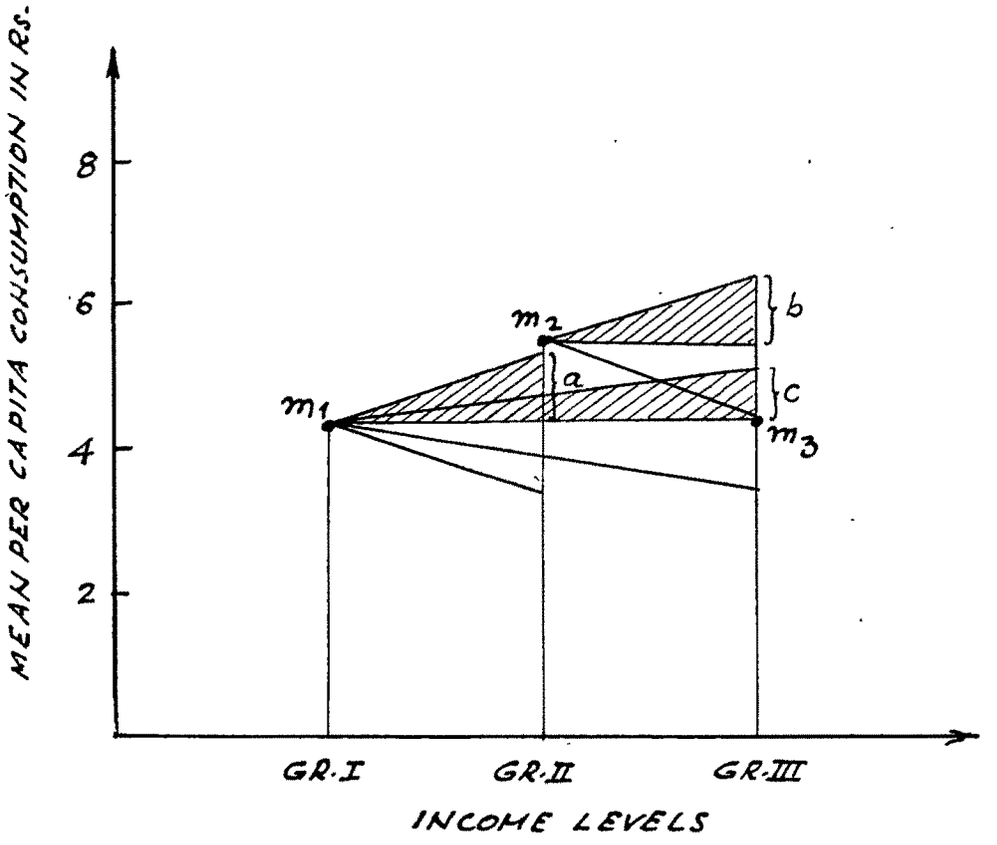
b = 24·480

c = 10·990

GRAPH: 8.7

MEAN PER CAPITA MONTHLY EXPENDITURE ON DAL IN Rs. AT THREE INCOME LEVELS

TYPE-IV (d)



$a = 0.950$

$b = 1.030$

$c = 0.800$

Table 10.1: Means, Standard Deviations and Coefficients of Variation of Per Capita Monthly Expenditures of Households Classified into Three Income Groups, on Certain Commodities and Services

I = Less Affluent (Rs.650-1850 aggregate monthly expenditure)
II = Moderately Affluent (Rs.1850-3050 aggregate monthly expenditure)
III = Highly Affluent (Over Rs. 3050 aggregate monthly expenditure)

Type	Commodity	I			II			III		
		Mean	S.D.	Coeff.of Variation	Mean	S.D.	Coeff.of Variation	Mean	S.D.	Coeff of Variation
1	2	3	4	5	6	7	8	9	10	11
I	Vegetables	15.13	7.773	0.51	19.77	11.718	0.59	30.56	23.707	0.78
	Fruits	8.11	6.011	0.74	11.64	7.821	0.67	21.22	19.230	0.91
	Electricity	6.03	5.197	0.65	11.77	6.416	0.55	16.97	12.008	0.76
	Servants	11.62	9.422	0.81	16.99	12.999	0.76	53.00	42.895	0.81
	Conveyance	24.35	46.893	1.92	48.03	48.031	1.00	81.67	65.000	0.79
	Rent	63.95	42.579	0.67	111.56	76.433	0.68	153.00	86.487	0.57
II	Spices	2.13	1.685	0.79	2.89	1.189	1.18	5.26	7.919	1.49
	Oil	11.95	5.032	0.42	12.99	5.697	0.44	16.60	10.534	0.63
	Entertainment	10.73	10.989	1.02	11.66	8.141	0.70	20.81	20.669	0.99
	Clothing	24.56	20.611	0.84	31.53	23.782	0.75	41.06	29.362	0.71
III	Cosmetics	8.71	8.501	0.99	13.76	11.705	0.85	16.08	18.226	1.13
	School fees	18.75	14.632	0.78	31.77	33.181	1.04	45.03	52.104	1.16
	Insurance	33.85	45.087	1.34	65.46	62.000	0.95	70.22	64.607	0.92

(Continued...)

(Table 8.1 continued)

Type	Commodity	I Mean	I S.D.	I Coeff.of Variation	II Mean	II S.D.	II Coeff.of Variation	III Mean	III S.D.	III Coeff of Variation
IV a	Other cereals	1.24	1.634	1.32	1.15	1.122	0.98	2.03	2.890	1.42
	Eating out	7.49	16.456	2.20	7.03	9.590	1.36	13.42	17.367	1.29
	Post & Stationary	3.13	5.729	1.83	3.86	4.421	1.15	5.69	5.952	1.46
b	Medical	8.90	9.542	1.72	14.36	13.958	0.97	11.39	10.821	0.95
c	Footwear	4.58	3.351	0.73	5.76	7.909	1.37	7.33	5.493	0.75
	Vacation	16.84	12.539	0.74	35.46	28.611	0.81	32.89	23.520	0.72
	Functions	2.90	2.236	0.78	4.54	6.219	1.37	6.81	6.059	0.89
d	Sal	4.28	2.458	0.57	5.44	3.098	0.57	4.26	2.465	0.57

Table 8.2: t-values of Differences-in-Means tests Between Mean Per Capita Expenditures of the Low, Middle and High Income Groups taken

Pairwise : I - Between low and middle income groups
II - Between middle and high income groups
III - Between low and High income groups

Type	Commodity	t-values I	II	III
I	Vegetables	2.74**	3.58**	4.32**
	Fruits	2.97**	4.57**	4.15**
	Electricity	3.76**	4.38**	3.14**
	Servants	2.80**	6.79**	7.40**
	Conveyance	2.90**	4.46**	3.41**
	Rent	4.59**	6.16**	2.89**
II	Spices	1.66	2.82**	3.45*
	Oil	1.14	2.65**	2.62**
	Entertainment	0.35	2.08*	3.80**
	Clothing	1.85	2.88**	2.06*
III	Cometics	2.91**	0.91	2.45*
	School Fees	2.83**	1.58	3.64**
	Insurance	3.43**	0.42	2.86**
IV a	Other Cereals	0.37	2.57*	1.56
	Eating Out	0.20	2.79**	1.46
	Post and Stationery	0.82	2.03*	1.81
b	Medical	2.71**	1.27	1.04
c	Footwear	1.15	1.22	2.72**
	Vacation	1.54	0.21	2.92**
	Functions	1.64	1.56	3.83**
d	Dal	2.44*	2.28*	0.05
	d.f.	147	104	113

** Significant at 0.01 level
* Significant at 0.05 level

The terms low, middle, high refer to Income group I, II and III as defined on page 143.