
Complexity of Food Choice and Statistical Techniques

Dr.R.Latha, Dr.T.Thegaleesan

Assistant Professor of Economics, Department of Economics, Annamalai University, Chidambaram, Tamilnadu,
(Deputed To Tamilnadu Govt. College)

Abstract:

Preamble:-The food choice is complex and obvious that the factors also vary according to the individuals' life style and the determinants too. Food choice varies from one individual to another individual. Thus, the intervention to modify food choice behavior will not be suitable for all groups. Rather, interventions are needed towards different groups of the population with consideration of both rural and urban among many factors (determinants) which, shows their influence on food choice.

Objectives: - To identify more specific determinants out of many determinates (Complexities) which determine the respondents' food choice in socio-economic background of respondents in respective study area using the factor analysis. Narrow down the influencing variables is alone focused in this study and further statistical analysis is not entertained.

Methodology:-The sample is n=300 (150 from each rural and urban). It is comparative study of rural and urban. The survey period is 2016. The factor analysis has been used to find out more important relevant variables from complex one.

Statistical Tools: The Factor analysis has been used for data reduction purpose from complexity of variables. It is a direct interview method of data collection by the researcher. The Interview schedule has been framed by the researcher for appropriation of data.

Results:-In factor analysis, the extraction method has been used. The Rotated component matrix splited and identified the socio-economic variables.

Key words:- Food Choice, socio-economic variables, income, savings, investment, age, sex, assets, occupation, religion, education, community, factor analysis, extraction method.

1. INTRODUCTION

Social Aspects of food choice

Education and Knowledge: The level of education influences dietary behavior of adulthood (Kearney et al. 2000). The knowledge about good nutrition and good dietary behaviors are not as much associated with strong knowledge about health but, which is not directly lead to direct action where individuals are unsure how to apply their knowledge. In India, it is contrarily to the situation and nothing has much influence of education on food choice.

Social and Cultural

What people eat is solely determined by the circumstances that are essentially subject to social, customs and cultural behaviour. The country which hold the sufficient studies show the differences in different social classes with regard to the food choice. Poor diets surely lead to under- nutrition otherwise known as micro-nutrients deficiency and over-nutrition which otherwise termed as energy rich consumption which biologically leads in overweight thereby obesity which is in sedentary life style environment. Problems that faced by different society needs different levels of expertising and intervention while selecting good food choice in their consumption. Cultural factors are also however amenable to change. For instance, when we do migrate to a new country, every individual will be bounded to adopt particular food habits according to the local culture and civilizations. The family is dominant and widely recognized as being significant in food selection. Because, the family and friends are a source of encouragements in making and sustaining dietary changes, and adopting dietary behavior that can be acceptable to them, which may benefit the individual from eating behaving of others (Anderson et al 1998).

Social setting: Even though the majority of food is taken in the home, an increasing proportion is eaten outside the home, e.g. in schools, at work place and in restaurants. The availability of unhealthy food away from the home is increases the consumption unhealthy foods especially in outer place and working places. However, access to healthy food options is limited in many working places and school environments.

Meals pattern: People are eating food daily for different purpose. The purpose vary from occasions to occasion. The reasons behind choosing different purpose for one occasion to the other must be explorable. Anyhow, to investigating such influencing variable for the food choice at different eating occasions is essential.

The evidence shows that snacking might have effects on energy and nutrient intakes but not as much consideration of body mass index BMI (Hampl et al. 2003). However, normal weight and overweight persons may differ in their preference when snack foods are available at free of cost and in filling their compensatory mechanisms in between intake gap. Moreover, the variant in snack may be an important aspect to adjust their intake mechanism to meet energy needs up to get the proper meal. Thus, the education, nutrient knowledge, culture, customs, social support, working place, family, friends circles, and junk food such as like snacking influence much besides the sociological variables viz, age, sex, marital status and family types.

Economic Aspects of food choice

The relationship between low economic status and poor health duly influenced by gender, age, culture, environment, society, community, life style and health status (Acheson et al.1998) The cost of food is also a predominant determinant of food choice and the cost is prohibitive or not fundamentally depends on the income of the individuals. The low-income groups very difficult to get a balanced healthy diet (nutrition) and this is termed as food poverty or otherwise termed as food insecurity. The reasons for this kind of food poverty are cost, accessibility and the knowledge. In any economy, the intake of energy rich and nutrient-poor food is the due to of lack of money. To buy good and nutrient rich food, the price on healthy foods also appears to be burden and costly in low-income groups. Thus, low-income groups consume unbalanced diets particularly low intake of fruits and vegetables (De Irala-Estevez et al. 2000) Accessibility of food stuffs to shops in town and semi-town is another important physical factor which influencing the food choice. It is depends on the cost of transportation due to geographical location. Healthy foods are more expensive when available within towns and cities limits. However, improving access alone not increase purchase of additional fruit and vegetables, which is an expensive still. Many studies indicates that the level of education too have influence on dietary intake habits (Kearney et al. 2000) Thus, low-economic status, cost, accessibility, education, knowledge, availability in near place, transportation and geographical location influences the selection of food under economic aspects. Each variable plays as determinants and linking each other in some way to make the confusion on food choice selected by the people.

Biological variables of food choice

Hunger and satiety: Humans need energy and nutrients to survive in this world and have to give response to the hungry and satisfaction. Satisfaction is the state of no hunger between two eating occasions. Human beings nervous system is involved in controlling the balance between hungry, appetite stimulation and intake of food. The macronutrients such as carbohydrates, proteins and fats are giving satiety signals to the body.

Palatability: Palatability is proportionate to the pleasure when eating a particular taste of food. It depends on the sensory perception food like taste, smell, and appealing. Sweets and high-fat foods have an undeniable sensory appeal. The influence of palatability on appetite and food intake of humans been investigated in many studies. There is an increase in food intake as palatability increases. Increasing in food variety can lead to increase food and energy intake and in the short-term alteration of energy level of body (Sorensen et al. 2003)

Sensory perception: 'Taste' is a major influence on food intaking. In practical, 'taste' is the sum of all types of sensory appealing that produced by the injection of a food. These sensory aspects are thoughts of influence, in particular, spontaneity in general on food choice. From the early age, taste and customs influence on the selection food. Tasting sweetness and an omitting bitterness are depends upon an instinct of human sensory perceptions, which come from birth (Steiner 1977). Tastes and preferences of food which develop through the experiences of attitudes, beliefs and expectations (Clarke 1998) Thus, Hungry, satiety, Palatability, Sensory perception, attitudes, beliefs expectations and preference plays a dominant role in selection of food stuffs under biological variables.

Food choice and Psychological variables

Stress: Stress is a common in modern life and can affect the health, such as physical inactivity (paving sedentary life style) smoking, working environment. The stress movement literally can influence the food choice. The effect of stress on food choice depends on the circumstances/environment of the people. In general, due to stress the some people eat more and some people eat less than normal quantity (Oliver & Wardle 1999). Many studies suggest that if, working environment stress is persist, then it adverse effects dietary changes into poor choice of food and could result in increasing the possibility of consumption there by weight gain finally leads morbidity such as particularly cardiovascular risk (Wardle et al. 2000)

Mood: Nowadays the food choices are literally influence by our mood. The consumption of food for the enjoyment sake giving weight gain and is a struggled experience by many people which is eating without proper hungry. Generally, women like the food item than men (Dye & Blundell 1997)

Thus, the issues of food choice is complex from the above, and the food choice variables vary according to life and the economic power of one will vary from one person to another person or group of the people. specific type of analysis to modify food choice behavior will not suitable for whole population rather, researches are needed for different groups of the population with consideration to the many factors influencing the food choice.

Thus in narrow, the determinants of food are highly complicated. The hungry is always triggering for eating. However, what to eat is not determine solely by physiological or nutritional needs. Many other factors that determine the food selection includes: (i) Biological determinants such as: hungry, appetite, and taste (ii) Economic determinants such as: cost, income, availability (iii) Physical determinants of those access, education, skills, and time (iv) Social determinants such as: culture, family, and sex marital status and (v) the Psychological determinants such as; mood, stress and attitudes, beliefs and knowledge. These are interlinked and always enmeshed with the every individual in the society to select their food for their consumption.

2. OBJECTIVES OF THIS STUDY

In the wake of handling above information the straight forward (direct) facts have been collected to discover the connection between the factors and sustenance determination selection of food stuffs (as example of persons)

3. METHODOLOGY, AREA AND PERIOD OF THE STUDY

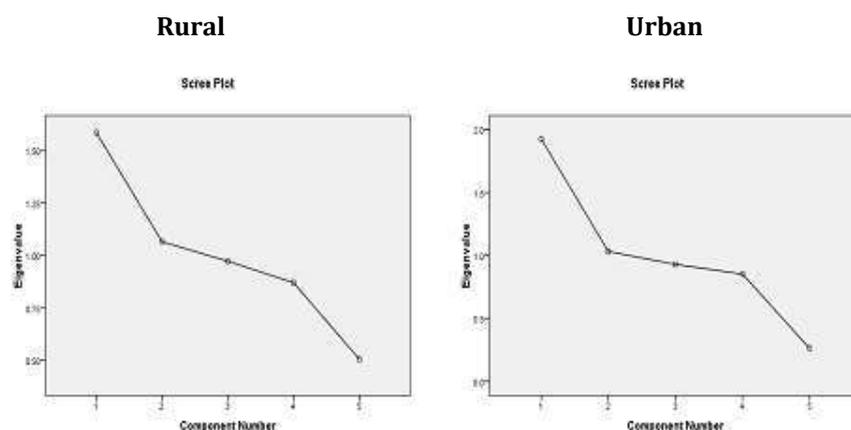
In India the Tamilnadu is one of the states of south region in which Villupuram District has been selected. It is divided in rural and urban. The urban populace of Koilyanur square comprises 1, 45,874 and the provincial populace of Vanur square which comprises 1, 64,696. This study has picked .1% of samples chosen for both provincial and urban. On this based of the strategy, the examining size is 150 in urban, and 150 in rustic. The study period is 2016. The data reduction technique has been used with the help of factor analysis. It is direct interview method of data collection by the researcher. The Interview schedule has framed by the researcher for appropriation of data collection.

4. STATISTICAL TOOLS

This research embraced stratified arbitrary examining strategy for this investigation. The strata have been partitioned into provincial and urban and proportionate examining got from gatherings. This size comprises both male and female. In order to data reduction from the complexity the factor analysis has been used to find out more important relevant variables. The Rotated component matrix splitted (selected) the socio-economic variables. Such variables are analyzed as socio- economic variables.

5. ANALYSIS AND INTERPRETATION

Factor analysis of social variables for Rural and Urban area



Rotated Component Matrix^a

Particulars	Component	
	1	2
Age of the Respondents	-.773	-.073
Sex of the Respondents	.436	-.024
Religion of the Respondents	.195	.782
Community of the Respondents	-.300	.674
Educational Qualification	.804	-.128

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 3 iterations.

Rotated Component Matrix^a

Particulars	Component	
	1	2
Age of the Respondents	.800	-.113
Sex of the Respondents	.261	-.761
Religion of the Respondents	.256	.567
Community of the Respondents	.574	.350
Educational Qualification	-.904	-.009

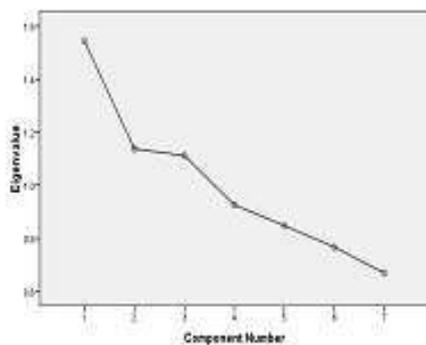
Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 3 iterations.

Under Factor analysis, the study has selected social variables for rural and urban categories in the study area. The extraction method in factor analysis is used to understand the most influencing variable among the social variable that are selected for the study. The Rotated component matrix have splitted the social factors in to two factors. Factor analysis is often used in data reduction to identify a small number of factors that explain most of the variance observed in a much larger number of manifest variables. In rural area, the most influencing factors are educational status as the first component (.804) and the religion of the respondent is selected as second component (.782). Likewise, in urban area, age as first component (.800) and the religion as second component (.567).

Factor analysis for Economic variables for Rural and Urban area

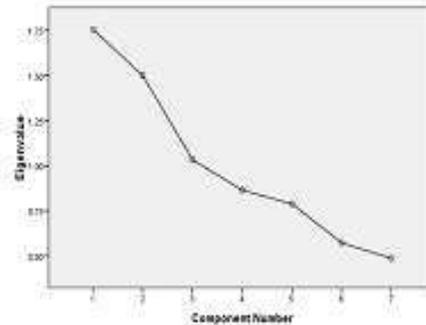
Rural

Scree Plot



Urban

Scree Plot



Rotated Component Matrix^a

Particulars	Component		
	1	2	3
Occupation	.515	-.364	-.195
Income of the respondents (Per month)	.167	-.553	.041
Savings of the Respondents	.755	.161	.246
Investment profile of the respondents	-.068	.286	.682
Assets (Movable and immovable)	-.648	.107	.251
Expenditure	.110	.790	.046
Based on price	.045	.291	-.771

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

Rotated Component Matrix^a

Particulars	Component		
	1	2	3
Occupation	.243	.599	.097
Income of the respondents (Per month)	.018	.680	-.241
Savings of the Respondents	.757	.013	-.102
Investment profile of the respondents	.099	-.743	-.103
Assets (Movable and immovable)	-.004	.040	.944
Expenditure	-.710	.224	-.400
Based on price	.693	.312	-.028

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

Under factor analysis, the study has selected Economic variables for both rural and urban categories. The extraction method in factor analysis is used to understand the most influencing variable among the economic variable for the study. The rotated component matrix have splited the economic factors in to three factors. In Rural area, the most influencing factors are savings as the first component (.755) expenditure on food as the second component (.790) and the investment of the respondent is selected as third component (.682). Likewise, in urban area, the Rotated component matrix have splited the economic factors in to three factors. In urban area, the most influencing factors are savings of the respondents as the first component (.757), the income if the respondent is selected as second component (.680) and the asset holding of the respondent as third components (.944)

6. CONCLUSION

Thus, statistically, this study identified most influencing factor with help of factor analysis. Under sociological variables, few determinants such as the age, sex, religion, community and educational status are identified. And in economic variables the determinants such as formal and informal occupation, income, savings, movable and immovable investment, assets, daily and monthly expenditure and the selection of food choice based on its price have been identified out of many variables those given in introduction of this paper.

Thus, it reduced the data complexities. To establish and analyzing these variable's relationships, such as correlations, multi-co linearity the extra desirable appropriate statistical tools can be used such as descriptive, MLRM, chi-square at the discretion concerned researchers. Whenever the dependent variables are more complex for independent variable the factor analysis could be more helpful to find out most influenced to those dependent variables.

REFERENCES

- [1] Anderson AS, Cox DN, McKellar S, Reynolds J, Lean MEJ, Mela DJ (1998) *Take Five, a nutrition education intervention to increase fruit and vegetable intakes: impact on attitudes towards dietary change. British Journal of Nutrition 80: 133-140.*
- [2] Berkman LF (1995). *The role of social relations in health promotion. Psychosom Med. 57(3):245-54.*
- [3] Clarke JE (1998) *Taste and flavour: their importance in food choice and acceptance. Proceedings of the Nutrition Society 57: 639-643.*
- [4] Cox DN, Anderson AS, Lean MEJ, Mela DJ (1998b) *UK consumer attitudes, beliefs and barriers to increasing fruit and vegetable consumption. Public Health Nutrition 1: 61-8.*
- [5] Cox DN, Anderson AS, Reynolds J et al. (1998a) *Take Five, a nutrition education intervention to increase fruit and vegetable intakes: impact on consumer choice and nutrient intakes. British Journal of Nutrition 80: 123-31.*
- [6] De Almeida MDV, Graca P, Lappalainen R et al (1997). *Sources used and trusted by nationally-representative adults in the European Union for information on healthy eating. European Journal of Clinical Nutrition 51: S8-15.*
- [7] De Irala-Estevez J, Groth M, Johansson L, Oltersdorf U, Prattala R & Martinez-Gonzalez MA (2000) *A systematic review of socioeconomic differences in food habits in Europe: consumption of fruit and vegetables. European Journal of Clinical Nutrition 54: 706-714.*
- [8] Devine CM, Connors MM, Sobal J and Bisogni CA (2003) *Sandwiching it in: spillover of work onto food choices and family roles in low- and moderate-income urban households. Social Science and Medicine 56: 617-630.*
- [9] Dewberry C, Ussher JM (1994). *Restraint and perception of body weight among British adults. J Soc Psychol. 134(5):609-19.*
- [10] Dibsdall LA, Lambert N, Bobbin RF, Frewer LJ (2003) *Low-income consumers' attitudes and behaviour towards access, availability and motivation to eat fruit and vegetables. Public Health Nutrition 6(2):159-68.*
- [11] Donkin AJ, Dowler EA, Stevenson SJ, Turner SA (2000). *Mapping access to food in a deprived area: the development of price and availability indices. Public Health Nutr. 3(1):31-8.*

-
- [12] Dr. France Bellisle, (2005) *EUFIC (European Food Information Council) The Determinants of Food Choice, Review 04/2005*
- [13] Dye L, Blundell JE (1997) *menstrual cycle and appetite control: implications for weight regulation. Human Reproduction 12(6):1142-51.*
- [14] Faugier J, Lancaster J, Pickles D, Dobson K (2001) *Barriers to healthy eating in the nursing profession: Part 2. Nurs Stand.15 (37):33-5.*
- [15] Feunekes GIJ, de Graaf C, Meyboom S and van Staveren WA (1998) *Food choice and fat intake of adolescents and adults: associations of intakes within social networks. Preventive Medicine 27: 645-656.*
- [16] French SA, Jeffery RW, Story M, et al. (2001) *Pricing and promotion effects on low-fat vending snack purchases: the CHIPS Study. American Journal of Public Health 91: 112-7.*
- [17] Hampl JS, Heaton CL, Taylor CA (2003) *Snacking patterns influence energy and nutrient intakes but not body mass index. Journal of Human Nutrition and Dietetics 16(1):3-11*
- [18] Kearney M, Jearney JM, Dunne A&Gibney MJ (2000) *Sociodemographic determinants of perceived influences on food choice in a nationally representative sample of Irish adults. Public Health Nutrition 3(2): 219-226.*
- [19] Kristal AR, Glanz K, Curry SJ, Patterson RE (1999) *How can stages of change be best used in dietary interventions? Journal of American Dietetic Association 99: 679-684.*
- [20] Oliver G, Wardle J (1999) *Perceived effects of stress on food choice. PhysiolBehav 66: 511-515.*
- [21] Paeratakul S, Lovejoy JC, Ryan DH, Bray GA., "The relation of gender, race and socioeconomic status to obesity and obesity co - morbidities in a sample of US adults." *International Journal of Obesity Related Metabolic Disorders: journal of international association for the study of obesity. 2002 Sep; 26(9):1205-10.*
- [22] Shepherd R (1999) *Social determinants of food choice. Proceedings of the nutritional Society 58:807-812.*
- [23] Sorensen LB, Moller P, Flint A, Martens M, Raben A (2003). *Effect of sensory perception of foods on appetite and food intake: a review of studies on humans. Int J Obes Relat Metab Disord. 27:1152-1166.*
- [24] Steiner JE (1977). *Facial expressions of the neonate infant indicating the hedonics of food-related chemical stimuli. In: Weiffenbach J. ed. Taste and development: The Genesis of Sweet Preference. (DHEW Publication No. NIH 77-1068). Washington DC: US Government Printing Office, pp 173.*
- [25] Stubbs RJ, van Wyk MC, Johnstone AM & Harbron CG (1996) *Breakfasts high in protein, fat or carbohydrate: effect on within-day appetite and energy balance. European Journal of Clinical Nutrition 50: 409-17.*
- [26] Thegaleesan.T, Renganathan R. 'A Theoretical Review of the Determinants of Food Choice', *Humanities Journal, Annamalai University, Vol.50 ISSN0517-872X, September 2016.*
- [27] Wardle J, Steptoe A, Oliver G, Lipsey Z (2000) *Stress, dietary restraint and food intake. Journal of Psychosomatic Research 48: 195-202.*

Websites

- [1] www.villupuram.tn.nic.in
- [2] <http://www.eufic.org/article/en/expid/review-food-choice/>