

THE IMPACT ON HOUSEHOLD LEVEL OF LIVING
OF AN INCREASE IN HOUSEHOLD INCOME IN
THE INTERLAKE AREA OF MANITOBA

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ABSTRACT

THE IMPACT ON HOUSEHOLD LEVEL OF LIVING OF AN INCREASE IN HOUSEHOLD INCOME IN THE INTERLAKE AREA OF MANITOBA

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Recent proposals to improve the level of living by income supplements necessitated a discussion of the impact of an income increase on the level of living. The components of the level of living were ascertained by a review of the literature. A qualitative discussion of the impact of income on both the consumption and non-consumption aspects was presented. Data from a survey of household income and expenditure for the Interlake Area in 1968 were used to develop an analysis of the consumption response to an income increase. The relation of household consumption expenditures by category to their respective components of the level of living was discussed.

It was found that income provides a positive and direct impact on only a few components of the level of living, a positive but indirect impact on other components, a negligible impact for still other components, and in two cases an income increase provides a negative impact on the

level of living.

Thus public policies which propose to increase the level of living by an income transfer must recognize that not all components are equally affected nor are all components necessarily affected.

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CHAPTER I

INTRODUCTION

A) STATEMENT OF PROBLEM

In response to a general concern for the actual living conditions or the level of living of people, various forms of income supplement programs have been proposed. The first major proposal of recent times was a negative income tax proposal by Milton Friedman.¹ Tobin,² Green,³ Watts,⁴ and others⁵ have studied the intricacies of various forms of income supplements. The ultimate aim of all income

¹Milton Friedman, Capitalism and Freedom (Chicago: University of Chicago Press, 1962), pp. 190-196.

²James Tobin, Joseph A. Pechman, and Peter M. Mieszkowski, "Is a Negative Income Tax Practical?," The Yale Law Journal, Vol. 77, No. 1 (November, 1967), pp. 1-27.

³Christopher Green, "Guaranteed Income Plans--Which One is Best?," Transaction, January/February, 1968, pp. 49-53; Christopher Green and Robert J. Lampman, "Schemes for Transferring Income to the Poor," Industrial Relations, Vol. 6, No. 2 (February, 1967), pp. 121-137.

⁴Harold W. Watts, "An Economic Definition of Poverty," On Understanding Poverty, ed. Daniel P. Moynihan (New York: Basic Books, 1968), pp. 316-329; Harold W. Watts, "The Iso-Prop Index: An Approach to the Determination of Differential Poverty Income Thresholds," The Journal of Human Resources, Vol. II, No. 1 (Winter, 1967), pp. 3-18.

⁵For a discussion of the cost of a guaranteed annual income in Canada, see Ronald W. Crowley and David A. Dodge, Cost of the Guaranteed Annual Income (Kingston: Queen's University, 1970).

supplement programs is to raise the level of living. There has been little attempt, however, to define the components of the level of living and even less of an attempt to relate income to each component. There is a need for a consideration of the components of the level of living, not for the purpose of measuring the overall level of living nor for the purpose of specifying a minimum level of living, but for the purpose of illustrating which components an income supplement is able to increase. An income supplement in fact represents a decision to increase specific components of the level of living; an increase in all the components of the level of living will not, in general, be facilitated. In other words, a discussion of an income supplement in the context of components of the level of living

will not tell us what choices to make in inequality-reduction, but it can prevent us from complacently ignoring the fact that choices are being made.⁶

This problem is important on the Canadian scene. The Special Senate Committee on Poverty is expected to propose a feasible guaranteed annual income program to alleviate low levels of living (or poverty).⁷ Parliament is reviewing a white paper on welfare reform which is

⁶S. M. Miller et al., "Poverty, Inequality, and Conflict," The Annals of the American Academy of Political and Social Science, Vol. 373 (September, 1967), p. 16.

⁷The forthcoming report of the Special Senate Committee on Poverty, Honourable David A. Croll, Chairman.

concerned primarily with income supplements.⁸ In Manitoba, the Premier has announced that a trial guaranteed annual income program will be launched, likely within the 1971 calendar year.⁹ The aim of these income supplement programs is to improve the actual living conditions (that is, the level of living) of the people. Yet there has been limited discussion of the relationship of income to the level of living. The important questions are:

1) Does an increase in income always cause an increase in the level of living? If not, under what conditions does a decrease in the level of living occur?

2) Which components of the level of living cannot be affected by an increase in income?

The first question is important because it is essential to know the cases where an increase in income does not facilitate an increase in the level of living. The second question is important because if a component that cannot be altered by income is in fact the limiting factor in an individual's level of living, then an increase in income cannot facilitate an increase in the level of living.

Income can alter both non-consumption and con-

⁸ John Munro, Income Security for Canadians (Ottawa: Department of National Health and Welfare, 1970).

⁹ See "Schreyer outlines guaranteed annual income test," Winnipeg Tribune, Saturday, July 10, 1971.

sumption aspects of the level of living. A secondary consideration in this thesis arises from the fact that consumption expenditures are often taken to indicate (a change in) the level of living. This study shows that an increase in income constitutes, in terms of the potential consumption it enables, an increase in the level of living. However, using consumption expenditures to measure the level of living (or a change therein) is patently different. Nevertheless, this has been recommended by Orshansky.¹⁰ Podoluk¹¹ has suggested that two households are at the same level of living when an equal percentage of income is expended on food, clothing, and shelter. There seems to be a need for a discussion of the relation of consumption expenditure by category to its respective components of the level of living.

B) OBJECTIVES AND CONTRIBUTIONS OF STUDY

Measurement of the overall level of living of a single household is very difficult for two reasons:

- 1) adequate quantitative measures for all of the various components of the level of living are not available; and
- 2) there is no satisfactory method of assigning

¹⁰Mollie Orshansky, "How Poverty Is Measured," Monthly Labour Review, February, 1969, p. 40.

¹¹Jenny R. Podoluk, Incomes of Canadians (Ottawa: Queen's Printer, 1968), p. 185.

weights to the individual components in order to obtain a composite index of the level of living.¹²

Due to these two obstacles, this study does not attempt to measure the overall level of living. The primary aim is to discuss the impact of an increase in household income on each component of the level of living. Both consumption and non-consumption aspects of the level of living are considered. The impact of an increase in household income on household consumption expenditure is analyzed for the Interlake Area of Manitoba. In terms of the consumption aspect, the potential increase in consumption or saving which can arise from an increase in income constitutes an increase in the level of living. However, a measured increase in consumption does not necessarily indicate an increase in the level of living.

Thus the specific objectives of this study are:

1) to discuss the impact of an increase in income on each component of the level of living;

2) to determine the change in household aggregate consumption and household consumption expenditures by category due to an increase in income for Interlake Area households; and

3) to discuss the inadequacies of measuring a change in the level of living in terms of consumption

¹²Inter-household comparisons are subject to the same obstacles.

expenditures.

It is hoped that this study will contribute to public policy discussions concerning alternative programs for raising the general level (or certain specific components) of the level of living. This study discusses the nature of the impact on each component of the level of living that would arise from an increase in income. An increase in income enables a direct increase in some components, an indirect increase in other components, and a negligible impact on still other components. There are a few cases where an income increase provides a negative impact on the level of living.

Furthermore, this study shows the level of household income necessary to raise consumption in specific categories to a given level. Using housing as an example, the total cost of a program (such as a guaranteed annual income) which raises the consumption expenditure on housing by raising income can thus be estimated. This study therefore will provide one method of an overall evaluation process to determine relative costs of providing increased housing consumption by alternative programs, including for example, public housing or rent subsidies.

C) OUTLINE OF STUDY

A review of the literature was undertaken to discover various approaches for considering the level of living. This review is presented in Chapter II. Three

alternative approaches for the consideration of the level of living were chosen as the basis of the discussion. These approaches are presented in the first section of Chapter III. The second and third sections of Chapter III develop the theoretical framework of the consumption function and the Engel curve. The consumption function depicts the relationship between aggregate household consumption expenditures and household income. The Engel curve explains the relationship between categories of consumption expenditure and aggregate consumption expenditure.¹³ Thus, the consumption function shows the increase in total consumption due to an increase in income and the Engel curve reveals the change in consumption by category due to an increase in total consumption.

In general, an increase in income can alter both the consumption aspects of the level of living and the non-consumption aspects, such as status and security. A qualitative discussion of both aspects is presented in Chapter IV.

In Chapter V the consumption expenditure and income data for the Interlake Area are described and the definitions of income and the consumption categories are presented.

¹³ This study followed Prais and Houthakker in adopting total expenditure rather than income as the independent variable in the Engel function. See S. J. Prais and H. S. Houthakker, The Analysis of Family Budgets (Cambridge: Cambridge University Press, 1955).

Multiple regression estimates of the parameters of the consumption functions and the Engel curves are presented and discussed in Chapter VI. Chapter VII gives a quantitative analysis of the consumption aspect and relates expenditure in each category to its respective component. The remaining chapters enumerate the limitations, implications, and conclusions of the study.

CHAPTER II

REVIEW OF LITERATURE

Before reviewing the literature on the level of living, the concept of the level of living must be defined. Throughout this study, the term "level of living" refers to "the actual living conditions of a people."¹ This term is used with the aim of distinguishing between the actual living conditions and "the aspirations or expectations of a people, . . . the living conditions which they seek to attain or regain or which they regard as fitting and proper for themselves to enjoy,"² which is often the meaning ascribed to the term "standard of living".³

Since there is no literature known to this author specifically relating income to the various components of the level of living, the review of the literature is limited to:

- 1) a review of various approaches for considering the level of living; and

¹United Nations, Report on International Definition and Measurement of Standards and Levels of Living (New York: United Nations, 1954), p. 2.

²Ibid., p. 2.

³The concept of level of living also must not be confused with the term "cost of living". Cost of living refers only to the cost of purchasing a given quantity (and quality) of goods.

2) a review of the literature relating to attempts to measure the level of living.

Three approaches which provided an encompassing description of the level of living were selected for the basis of the discussion. These approaches are discussed fully in Chapter III and the impact of an increase in income on each approach is considered in Chapter IV.

A) CONCEPTS OF LEVEL OF LIVING

In 1949 the International Labour Organization stated that one of the main purposes of the study of family living conditions is to provide "as full information as possible with regard to levels and standards of living, including data permitting the analysis of income, expenditure, and savings in relation to them."⁴ It was stated that in addition to data on income, expenditure, and savings, information on "health, nature of living accommodation and amenities . . . and quantities of food consumed (as a basis for dietary and nutritional studies)"⁵ should be collected.

The United Nations' Report⁶ contained the argument that the satisfaction of all types of needs and wants

⁴International Labour Organization, Methods of Family Living Studies (Geneva: International Labour Organization, 1949), p. 7.

⁵Ibid., p. 50.

⁶United Nations, op. cit.

should be included in the concept of level of living. Thus an assessment of physical well-being and non-material factors was recommended. It was suggested that the level of living be considered in terms of:

- a) health, including demographic conditions;
- b) food and nutrition;
- c) education, including literacy and skills;
- d) conditions of work;
- e) employment situation;
- f) aggregate consumption and saving;
- g) transportation;
- h) housing, including household facilities;
- i) clothing;
- j) recreation and entertainment;
- k) social security; and
- l) human freedoms.⁷

This approach is adopted and discussed fully in Chapter III.

In 1961 the International Labour Organization⁸ published a collection of family living studies from various countries. The majority of the studies investigated only income and expenditure patterns. A few studies concentrated on specific aspects of the level of living such as housing, nutrition, employment status and health.

Another approach for considering the actual living conditions of people was advanced by Hugo E. Pipping. In his book Standard of Living: The Concept and its Place in Economics,⁹ Pipping developed two arguments. The first was

⁷ Ibid., p.26.

⁸ International Labour Organization, Family Living Studies (Geneva: International Labour Organization, 1961).

⁹ Hugo E. Pipping, Standard of Living: The Concept and its Place in Economics (Helsingfors, Finland: University of Helsingfors, 1953).

that the level of living can be the link between immeasurable wants and observed levels of consumer demand. Secondly, Pipping argued that the level of consumption is a narrower concept than the level of living. He viewed the level of living in terms of:

- 1) the family;
- 2) leisure and working-time;
- 3) consumption; and
- 4) saving.

Pipping's approach is also adopted and discussed in Chapter III.

In an article by S. M. Miller et al.,¹⁰ the level of living was discussed in terms of:

- 1) income;
- 2) assets, including consumer durables;
- 3) basic services;
- 4) social mobility and education;
- 5) political position; and
- 6) status and satisfaction.

Miller's approach is the third approach which is discussed in Chapter III.

Lorimer and Phillips,¹¹ in their study of a down-

¹⁰S. M. Miller et al., "Poverty, Inequality, and Conflict," The Annals of the American Academy of Political and Social Science, Vol. 373 (September, 1967), pp. 16-52.

¹¹James Lorimer and Myfanwy Phillips, Working People (Toronto: James Lewis and Samuel, 1970).

town city neighbourhood, consider the level of living of the people in terms of their family and social life, their economic life, and their political life.

The concept of level of living in economic theory is considered in terms of happiness or utility. Three fundamental axioms of pure economic theory are that each consumer has a preference function, that each consumer can give a preferential ranking of alternative consumption expenditure decisions, and that a greater consumption expenditure is always preferred to a smaller one.¹² That is, an increase in consumption expenditure indicates an increase in happiness or utility.

B) MEASUREMENT OF LEVEL OF LIVING

C. A. Moser¹³ attempted an aggregate analysis of the level of living in Jamaica. However, due to a lack of data, he was limited to an analysis of four aspects: education, nutrition, health, and housing.

Bertrand¹⁴ estimated the trend in the level of living of American farm families from an analysis of

¹²C. E. Ferguson, Microeconomic Theory (Homewood: Irwin, 1966), pp. 13-14.

¹³C. A. Moser, The Measurement of Levels of Living with Special Reference to Jamaica (London: Her Majesty's Stationery Office, 1957).

¹⁴Alvin L. Bertrand, Trends and Patterns in Levels of Living of Farm Families in the U.S.A. (Washington: United States Department of Agriculture, Information Bulletin No. 181, 1958).

time-series data on the possession of electricity, telephones, automobiles, running water, refrigerators, television sets, and home freezers.

In a study by Cowles, Siek, and Myers,¹⁵ the level of living was defined in terms of income and consumption expenditure. The change in the level of living was analyzed in terms of expenditure in the following categories: food, housing, clothing, recreation, personal care, medical care, church charity, school and miscellaneous, personal gifts, house operation, life insurance and savings, and household equipment. It was assumed implicitly, in this study as well as in the other studies reviewed, that an increase in measured consumption expenditure denoted an increase in the level of living.

Tsutomu Noda¹⁶ attempted an international comparison of the level of living. The countries included in his study were Japan, Taiwan, Korea, Thailand, Philippines, India, and Hong Kong. The analysis was developed along two lines. First, Noda used the monetary approach (based on per capita income and per capita expenditure by category) to obtain

¹⁵May L. Cowles, Mildred M. Siek, and Jean F. Myers, Where the Money Went: Changes in Family Living from 1940 to 1942 in 106 FSA Families in Wisconsin (Madison: University of Wisconsin, Agricultural Experiment Station Research Bulletin No. 155, 1945).

¹⁶Tsutomu Noda, "Comparisons of Level of Living in Japan and Selected Asian Countries," Rural Economic Problems, Vol. 4, No. 2 (May, 1968), pp. 61-78.

one measure of the level of living. Then he used a component approach to obtain another measurement. The components chosen were food, clothing, housing, light and fuels, health, education and reading, and transportation and communication. To obtain an aggregate index, Noda assumed that the weight of each component in the level of living index was equal to the weight of the expenditure on that component as derived from the respective national account statistics.

The United States' government, in its War on Poverty, assumed that family disposable income defined the family's level of living. Thus, families with equal incomes were assumed to be at the same level of living. The minimum level of income (or poverty line) was derived from the calculation of the cost of minimally nutritional meals and multiplying this cost by three. The figure "three" was chosen because it was observed that low-income families spend one-third of their income on food. Mollie Orshansky¹⁷ adjusted the poverty line to account for family size, sex of head of household, number of related children (under 18 years of age) in the household, and farm or non-farm status.

¹⁷Mollie Orshansky, "Counting the Poor: Another Look at the Poverty Profile," Social Security Bulletin, Vol. 28, No. 1 (January, 1965), pp. 3-29.

Madden, Pennock, and Jaeger¹⁸ assumed that two families are at the same level of living if they can afford the same level of food expenditure. The amount of income needed for a family to afford a given level of food expenditure was assumed to be determined by the family's "normal income level", the number and age of the children, the age of the head of the household, tenure (whether the family owned or rented its dwelling, the region (within the United States), and the urbanization environment of the household. Relatively stable consumption expenditures (excluding car purchase, medical care, and personal taxes) were used as a proxy for the "normal income level".

Podoluk¹⁹ observed that, in 1959, average Canadian urban families allocated one-half of their income to expenditures on food, clothing and shelter. She assumed that families spending an equal percentage of income on food, clothing and shelter were at an equal level of living. She then assumed that families spending 70 percent or more of their income on these categories should be considered

¹⁸J. Patrick Madden, Jean L. Pennock, and Carol M. Jaeger, "Equivalent Levels of Living: A New Approach to Scaling the Poverty Line to Different Family Characteristics and Place of Residence," Rural Poverty in the United States (Washington: President's National Advisory Committee on Rural Poverty, 1968), Chapter 29.

¹⁹Jenny R. Podoluk, Incomes of Canadians (Ottawa: Queen's Printer, 1968), p. 185.

poor or in poverty. The Economic Council of Canada²⁰ adopted this criterion of equal levels of living (or poverty lines) in its discussion of poverty.

In general, the studies reviewed above considered the level of living in terms of income or consumption expenditure. Moser and Noda, however, did attempt to measure the level of living by the use of components. They recognized that non-economic indicators were more meaningful in measuring some components. Examples of this approach are indicating the food component by measuring the average caloric intake of families, indicating the clothing component by the aggregate disappearance of fibre, indicating the housing component by the average number of rooms per household member, indicating the education component by the literacy rate or the average number of years of formal schooling, and indicating the health component by the number of years of life expectancy or the infant mortality rate.

The budget approach adopted by Orshansky and Podoluk seems particularly weak because it suggests that a discussion of income and consumption expenditures considers all of the components of the level of living and, furthermore, that a measured increase in consumption expenditure always implies

²⁰Economic Council of Canada, Fifth Annual Review: The Challenge of Growth and Change (Ottawa: Queen's Printer, 1968), p. 108.

a rise in the level of living.

There is no literature which explicitly discusses the effect of a change in income on each component of the level of living.

CHAPTER III

THEORETICAL CONSIDERATIONS

Various concepts of the level of living were reviewed in the previous chapter. The first section of this chapter adopts and presents three alternative approaches to the level of living upon which the remaining discussion is based. Chapter IV then relates an increase in household income to each of these three approaches. The second and third sections of this chapter introduce and develop the theory of consumption functions and Engel curves, which are used in the analysis of the consumption data for the Interlake Area.

A) LEVEL OF LIVING

This study adopted a component approach for considering the level of living. Components are "clearly delimited aspects or parts of the total life situation."¹ In other words, components are viewed as generally accepted ends of human endeavour. An aggregate measure of these components would provide an overall measure of the level of living. However, due to the two obstacles mentioned in the introduction (page four), an overall measure of the level of

¹United Nations, op. cit., p. 8.

living was not obtained. In fact, since the objective of this study was to indicate the impact of a change in income on individual components of the level of living and not to measure each component, there was no need to specify operative methods of measuring individual components. It was recognized that there are aspects of the level of living which are not readily classified as components (for example, political position). However, aspects such as political position which are important in a study of the level of living were treated as components for the purposes of discussion.

An indicator is a "specific factor used in statistical measurement"² of a given component. In a general sense, there are three classes of indicators:³

- 1) indicators of available resources (for example, quantity and quality of available schools);
- 2) indicators of utilization of resources (for example, the regularity of school attendance); and
- 3) indicators of the end-effects at which these resources are aimed (for example, grade completed or certificate obtained).

However, the acquisition of meaningful indicators for some components is very difficult (for example, human freedoms).

²Ibid., p. 8.

³C. A. Moser, op. cit., p. 84.

There is usually more than one indicator for each component. However, in the same sense that there is no satisfactory method for aggregating components to obtain an overall index of the level of living, there is no satisfactory way of assigning weights to individual indicators to obtain a measure of a component. For this reason, this study was limited to a discussion of the impact of an increase in income on individual components of the level of living. Thus, only in the case when an increase in income causes two different indicators of a given component to move in opposite directions will the nature of the impact on that component be unclear.

Another problem in the use of components is the interdependence of components. That is, a change in one component may cause a change in another component. This was another reason for not attempting to obtain an aggregate measure of the level of living.

The application of economic theory (or the monetary approach) provides only one class of indicators of the level of living. In the example of the education component, expenditure on education is only a partial indicator of the utilization by the household of available education resources. The end-effect of the education component, that is, a given level of education, is inadequately indicated. Furthermore, there are some components (such as human freedoms) for which no aspect of monetary expenditure

provides a potential indicator.

It was recognized that any discussion of the actual living conditions of a people (that is, the level of living) is limited because:

human needs and wants range from common biological needs--as for food, water, and protection against cold--to culturally-oriented motivations and wants which may differ from⁴ society to society or from individual to individual.

Thus, in order to enter into a discussion of the level of living, it was necessary to assume at the outset that households exhibit a common scheme of values or preferences.⁵

The discussion of the implications for the level of living due to an increase in household income is based on three alternative approaches for considering the level of living. The three approaches selected were those advanced

⁴United Nations, op. cit., p. 5.

⁵The United Nations' Report stated this assumption in the following way: "Even the simplest comparison of levels of living--that between two individuals--can be carried out only under the assumption of common values and requirements." (Ibid., p. 6.) Note that this assumption removed all consideration of social class from the discussion of the level of living. For a recent discussion of social stratification and the identification of subcultures, see James H. Copp, "Poverty and Our Social Order: Implications and Reservations," American Journal of Agricultural Economics, Vol. 52, No. 5 (December, 1970), pp. 736-744, and William C. Berleman, "Poverty--Some Dilemmas in Definition," Growth and Change, Vol. 1, No. 4 (October, 1970), pp. 27-32. However, the importance of social class in a discussion of the level of living seemed to be minimal in the light of Lorimer's observation that a blue-collar family who is "transplanted to the suburbs, and provided with a somewhat higher income, would be expected to change its way of living and become like other people." (James Lorimer and Myfanwy Phillips, op. cit., p. 50.)

by the United Nations' Report, Pipping, and Miller et al. These approaches are presented below.

i) United Nations' Report

The United Nations' Report recommended that the level of living be considered in terms of 12 components as listed on page 11. Although these components were designed for international comparisons, they are readily applicable to a discussion of household level of living. The United Nations' Report admitted that these components "do not include all the significant aspects of life which constitute the level of living, but . . . (they are) universally acceptable as significant."⁶

The health and demographic component considers the actual health situation of the members of the household. One indicator is the life expectancy of each of the household members. A factor contributing to good health is the nature of health services. Quantification of this factor would involve an investigation of a given family's distance to the nearest health service, the frequency of use (relative to the need of the family), and the quality of service provided.

The food and nutrition component considers the level of nutrition provided by the quantity and quality of

⁶United Nations, op. cit., p. 27.

food consumed.

The level of education can be indicated by the number of years of formal education completed. Further indicators (of the type that only indicate the availability of a resource) would be the number of available newspapers and the ownership of radios and television sets. The level of education is usually considered important for two reasons. In terms of an investment, higher levels of education usually enable higher monetary returns from work. Secondly, in terms of a consumption good, a higher level of education implies a greater ability to appreciate "the better things in life."⁷

Working conditions can be indicated by the hours worked per week and by the wage rate. These indicators are important in a discussion of the level of living. Some studies assume that households with equal incomes are at the same (economic) level of living. However, the number of hours worked or the number of people in the household with jobs is seldom considered. A more realistic comparison would take into account the hours worked and the number of wage-earners.

The employment situation, at the household level,

⁷For a further discussion of the investment versus consumption dichotomy, see John Vaizey, "Education as Consumption or Investment--A Public or Private Good?", Chapter 2 in The Economics of Education (London: Faber and Faber, 1962).

considers the occupation and status (that is, employer, employee, or self-employed) of the household members.

The transportation component is indicated by the quantity and quality of transportation services available to the household.

Housing involves the quantity (indicated by the number of rooms per family member) and the quality (indicated by the nature of construction, age, and facilities) of the dwelling occupied by the family.

The contribution of clothing to the level of living is important for protection from climatic elements. Once this need (biological) is met, further expenditure of resources on clothing results in clothing of better quality or a psychic return for "nice-looking clothing."

The recreation and entertainment component refers to the (pleasant) passing of leisure time. The type of activity which causes an increase in this component varies with such factors as social class, religious and ethnic affiliation, and the age of the members of the household. Thus, a selection of indicators is contingent on these factors. However, in general, the quantity, quality, and travel distance to any or all of the following can be considered as indicators of this component: cinema, museum, art gallery, concert hall, dance hall, parks, playgrounds, restaurants, and community centers.

The social security component considers the

contribution to the level of living by assistance programs such as unemployment insurance, medical insurance, family allowances, old-age pensions, and welfare.

Human freedoms concern the guaranteed rights (constitutional and operational) of the individual. Thus the upper limit of human freedoms that is available in theory (or constitutionally) and that which is actually attained are the prime indicators. Perhaps the more important indicator in our society is the extent of discrimination against members of minority groups with regard to an individual's upward mobility (that is, the de facto or operational upper limit).

ii) Pipping

Pipping's approach to the level of living was introduced earlier (page 12). Pipping considered the family to be a part of the level of living because the family is the center of an individual's social, economic, and political level of living. The family determines the degree of emotional and financial stability and the extent or absence of anxiety experienced by the individual. In other words, the family is important because it provides a common environment for its members and is thus the relevant unit of analysis in a study of the level of living. The size of the family indicates the potential proportion of total resources provided by the wage-earner(s) that is available

to each family member.⁸

Leisure, or more specifically, the ratio of leisure-time to working-time, is part of the level of living. An increase in this ratio, however, does not necessarily denote an increase in the level of living. For example, for those who like their work or for those whose work is "pleasant", work may be a desirable end.

The level of consumption denotes the contribution to the level of living which is obtained by the purchase of goods and services in the marketplace.

Planning for a period of family life presupposes saving (or dissaving) and thus the accumulated savings (or dissavings) become part of the level of living. The savings component is related to the consumption component because accumulated savings (or wealth) provide a reserve for future consumption. The savings component is also related to the family component because the financial security provided by the stock of wealth is a significant factor in the family relationship.

iii) S. M. Miller et al.

The approach of S. M. Miller et al. was presented earlier (page 12). They considered nearly all the aspects of the

⁸This study assumed that the family behaves as a single entity. That is, the same process of decision-making is used for all decisions and this process remains constant. As a result of this assumption, this study did not consider the distribution of the components of the level of living among the family members.

level of living enumerated as components by the United Nations' Report. The aspect of each of the latter components which can be obtained in the marketplace was considered by Miller et al. in their discussion of income. The aspect of each component which is a public good or service was considered in their discussion of basic services.

Miller et al. considered income to be an important component of the level of living because it indicates the command over goods and services that can be purchased in the marketplace. Furthermore, the confidence that income is assured for the whole year is an important amenity apart from the level of income.⁹

However, it was argued that current income is an inadequate indicator of the economic position of a family for five reasons:

- 1) income may be received in the form of capital gains, which are not included in the calculation of current income;

- 2) the future command over resources is inadequately indicated. Savings and pension accumulations are important for future command over resources plus providing confidence at the present time regarding the future;

⁹The effect of the source of income on one's social honour is considered in the discussion of status and satisfaction.

3) past expenditures affect present well-being, as in the case of household furnishings;

4) the quality of housing is not adequately reflected; and

5) individuals with temporarily low incomes may not experience a lowering of the level of income due to accumulated assets.

For these reasons Miller et al. recommended that assets be included as a component of the level of well-being. The quantity and quality of housing can be considered and the extent of ownership of consumer durables can be taken into account. The security provided by liquid assets or savings is included as well as the security of insurance and pension accumulations.

Furthermore, Miller et al. argued that basic services furnish important segments of total satisfaction and well-being. They posed two fundamental questions arising from the consideration of basic services and the level of living. The questions were:

1) Should a basic service be considered as an amenity in terms of a component of the level of living or as an investment in improving the capacity of individuals to gain access to resources in the marketplace?¹⁰

¹⁰This question need not be answered in the context of the present study because it is the impact of an increase in income that is being considered. If an increase in income causes an increase in a given basic service, then the

2) Should the criteria of measurement with regard to the level of living be in terms of availability or in terms of utilization relative to need?¹¹

The important services include health, education, neighbourhood amenities (such as sanitation control, police and fire protection, recreational facilities, libraries, parks, and playgrounds), public transportation, social services, and legal services.

Social mobility involves the intergenerational, the intragenerational, and, to some extent, geographic mobility of individuals through social class. Education is increasingly becoming the route to upward social mobility. More specifically, higher education enables entrance into a higher class of occupation and it is via occupation that education facilitates social mobility. Thus the level and quality of education received is an important indicator of this aspect of the level of living.

"The improvement of economic position does not

consideration becomes the relatively minor one of determining whether the increase in the basic service has a direct or indirect effect on the level of living. That is, once the impact on the basic service is determined, the nature of the impact on the level of living can be ascertained.

¹¹This is the problem of choosing indicators that measure availability, utilization, or end-effect of a given resource. The ideal indicator measures the end-effect at which the resource is aimed and not the availability or the utilization of the resource.

always bring with it advances in political position."¹²

The right to vote is a primary consideration, followed immediately in importance by the exercise of that franchise. However, important decisions are made administratively as well as legislatively. The consideration of political position thus also involves the quality of treatment received by individuals from agencies, the degree of representation or representativeness of the agency, and the degree of the psychological feeling of powerlessness of the individual. (These same factors should also be considered in the work situation.)

The component of status and satisfaction refers to the views that others hold of an individual (which is status) and the individual's degree of self-respect and contentedness (which is satisfaction). Miller et al. noted that a gain in income that is stigmatized diminishes the satisfaction of the income-recipients. An income supplement may be stigmatized either because of its source or because of the reason for which it is given. If an individual feels insulted because of the source or the reason for a supplement, the status and satisfaction component is decreased. The effect of job dissatisfaction on the component of status and satisfaction must also be recognized.

¹²S. M. Miller et al., op. cit., p. 42.

iv) Summary

The nature of the components outlined for each of the three approaches to the level of living are essentially similar and they are generally accepted as indicating the major elements of the level of living.

In addition to the components of the United Nations' Report, Pipping's argument directed considerable attention to the family as the center (and therefore determinant) of an individual's level of living. Also considerable importance was attached to the ratio of leisure-time to working-time.

Miller et al. considered the majority of the components suggested by the United Nations' Report in terms of income and basic services. For each component, that part which can be purchased in the private sector of the economy was considered within the income discussion and that aspect of each component which, in general, can be provided by the public sector was considered within the discussion of basic services. In addition, Miller et al. emphasized the ease of mobility through social strata, the political position, and the status and satisfaction of the individual.

B) CONSUMPTION FUNCTION

A consumption function is a relation that explains the level of a household's consumption expenditure as a function of income. This relation was important to this

study because aggregate consumption is a component of the level of living. Furthermore, aggregate consumption expenditure was divided into consumption categories (which themselves are components or indicators of components of the level of living) via the estimation of Engel curves. Thus the impact of a change in income on aggregate consumption was determined. Knowing the change in aggregate consumption expenditure, the change in each consumption category was obtained.

A fundamental assumption of the following analysis was that parameters estimated from cross-section data are applicable in time-series discussions. This assumption means that the change in consumption due to a change in income over time for a given household is the same as the difference in consumption between two households in cross-section that differ only by the given amount of income.

John Maynard Keynes¹³ introduced the concept of the consumption function. He hypothesized that aggregate consumption expenditure is a stable function of income and that the marginal propensity to consume is greater than zero but less than one. The marginal propensity to consume is defined as the unit change in consumption due to a unit change in income. This study viewed income as being comprised of three components (the return from human

¹³ John Maynard Keynes, The General Theory of Employment, Interest and Money (New York: Harcourt, Brace, 1936).

wealth, the return from non-human wealth, and the receipt of public and private transfer payments) which were summed to give total household income.

This study assumed that the price of each commodity facing each household was the same and also that the interest rate facing each household was the same.¹⁴ Thus the application of the results to different years must be corrected for changes in the interest rate and prices (that is, changes in both relative and absolute prices).

A major factor which was expected to cause household consumption behaviour to be different was the social environment of the household. This factor was taken into account by estimating separate functions for each of urban, rural non-farm, and farm households. In other words, this represented a hypothesis that there are different consumption preferences between urbanization classes. For example, the marginal propensity to consume of farm households was expected to be smaller than non-farm households at any given income due to the fact that farm business investments compete with the household for the use of farm income.

¹⁴That is, it was assumed there was no difference in time preference of consumption between households. The price of a good in the future in terms of the present price is the present price multiplied by $1/(1+r)^n$ where r is the interest rate and n is the number of time periods.

Another major factor which was expected to cause household consumption behaviour to be different was the size of the family. As the size of the family increases, the consumption requirements of the household increases. That is, at any given level of income, the consumption expenditure would be expected to increase as family size increased. The sum of the number of persons multiplied by the number of months each person was in the household within the year (termed "person equivalents") was taken to measure family size.

Modigliani, Brumberg, and Ando¹⁵ suggested that age (more correctly, the expected number of years of remaining life) is a significant variable for it is a determinant of the proportion of wealth expended on consumption. The variable age was included by calculating an annuitized net worth¹⁶ as the annual return from non-human wealth.

¹⁵ Franco Modigliani and Richard Brumberg, "Utility Analysis and the Consumption Function: An Interpretation of Cross-section Data," Post-Keynesian Economics, ed. K. K. Kurihara (New Brunswick: Rutgers University Press, 1954); Albert Ando and Franco Modigliani, "The 'Life-Cycle' Hypothesis of Saving: Aggregate Implications and Tests," American Economic Review, Vol. 53, No. 1 (March, 1963).

¹⁶ See Burton A. Weisbrod and W. Lee Hansen, "An Income-Net Worth Approach to Measuring Economic Welfare," American Economic Review, Vol. 58, No. 5 (December, 1968), pp. 1315-1329. The annuitized value of net worth was computed by the following formula:

$$a\text{NW} = \text{NW} \frac{r}{1.0 - (1.0 + r)^{-n}}$$

where NW is net worth (that is, total assets minus total liabilities), r is the rate of interest and n is the

Thus the consumption function adopted by this study was:

$$C = f(Y, N \mid \text{urbanization})$$

where C is aggregate annual household consumption expenditure, Y is the sum of total earned income, total transfer payments, and annuitized net worth, N is family size (in "person equivalents"), and urbanization refers to farm, rural non-farm and urban groups.

The multiple least-squares equation estimated for each urbanization group has the form:

$$\hat{C} = \alpha_0 + \alpha_1 Y + \alpha_2 N$$

The linear form was adopted as a first approximation of the true functional form. The double-logarithmic form, as was adopted for the Engel functions below, was not used because one cannot obtain the logarithm of a negative number.

There were a significant number of Interlake Area farm households reporting incomes less than zero for 1968.¹⁷

expected number of remaining years of life of the consuming unit. This calculation assumed the consuming unit will allocate the return from net worth equally among the remaining years of the lifespan. Furthermore, it was assumed that the head of the household will die when he reaches the age of average life expectancy and the consuming unit will disappear when the head dies.

¹⁷ See Chapter VI, Table VI-A, page 59.

C) ENGEL CURVE

An Engel curve is a function relating the equilibrium quantity purchased of a commodity to the level of money income.¹⁸ This study adopted the suggestion of Prais and Houthakker of using total consumption expenditure as the explanatory variable. They argued:

the use of total expenditure as the determining variable in the Engel curve can be justified on the assumption that while total expenditure may depend in a complicated way on income . . . , the distribution of expenditures among the various commodities depends only on the level of total expenditure.¹⁹

Engel curves were important in this analysis because the effect on each consumption category due to a change in total expenditure was desired. (The change in total expenditure due to a change in income was determined by the consumption function.) The relation of each consumption category to the level of living is considered in Chapter VII.

It was further hypothesized that the size of the family significantly influenced the distribution of total consumption among the various commodities. For a given amount of total consumption expenditure, as family size increases the consumption in some categories (necessities) will increase and consumption in other categories (luxuries) will necessarily decrease by the same amount. Thus the

¹⁸C. E. Ferguson, Microeconomic Theory (Homewood: Irwin, 1966), p. 36.

¹⁹S. J. Prais and H. S. Houthakker, The Analysis of Family Budgets (Cambridge: Cambridge University Press, 1955), p. 81.

estimated function is:

$$c_i = f(C, N)$$

where c_i is consumption expenditure in category i .²⁰

The functional form adopted was the double-logarithmic form:

$$\log \hat{c}_i = \beta_0 + \beta_{1i} \log C + \beta_{2i} \log N$$

Prais and Houthakker, and later Jorgensen,²¹ found the double-logarithmic form to provide the best statistical fit. Another advantage of the double-logarithmic form is the automatic correction for heteroscedasticity.²² In

²⁰The hypothesis that total consumption expenditure (C) will increase as family size (N) increases was tested in the consumption function. Thus the interdependence of C and N should be taken into account when discussing the results of the Engel function. The definitions adopted for the consumption categories (c_i) attempted to minimize the interdependence of consumption categories. (See Chapter V, Section C, page 55.) Yet the last category (c_n) is obviously determined by the sum of all the other categories

$\left(\sum_{i=1}^{n-1} c_i \right)$. That is, $C - \sum_{i=1}^{n-1} c_i = c_n$. However, Engel functions for all the categories were estimated.

²¹Erling Jorgensen, Income-Expenditure Relations of Danish Wage and Salary Earners (Copenhagen: University of Copenhagen, 1965).

²²Heteroscedasticity refers to the situation where the variance of the scatter of points about a regression line is not constant. See J. Johnston, Econometric Methods (New York: McGraw-Hill, 1963), p. 208.

general, the variability of expenditure in a given category (c_i) increased as total consumption (C) increased, as indicated in Figure III-A (page 40). In other words, the distribution of residuals about the regression line depended upon the value of C . The double-logarithmic transformation eliminated heteroscedasticity as shown in Figure III-B (page 40). In this case the distribution of residuals about the regression line was independent of $\log C$.

The marginal propensity to consume total expenditure is the unit change in expenditure in category i due to a unit change in total expenditure. The partial elasticity with respect to total expenditure is the percent change in expenditure in category i due to a one percent change in total expenditure.²³ Similar definitions hold with respect to income. Prais and Houthakker noted that the partial "elasticity of an item with respect to income is the product of its (partial) elasticity with respect to total expenditure and the elasticity of total expenditure with respect to income."²⁴ The formulas for the double-logarithmic function can be summarized as follows:

²³The remaining discussion of elasticities in this study considers only the partial elasticity with respect to total expenditure and with respect to income. That is, the interdependence of total consumption and family size is ignored (or, more correctly, family size is held constant).

²⁴S. J. Prais and H. S. Houthakker, op. cit., p. 101.

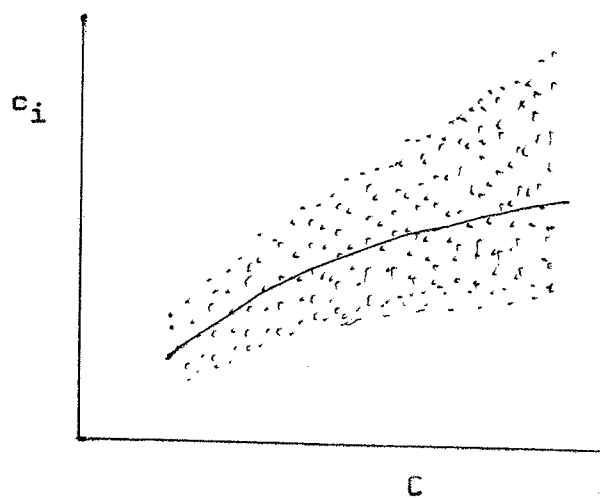


Figure III-A

Heteroscedasticity: variability increases as C increases

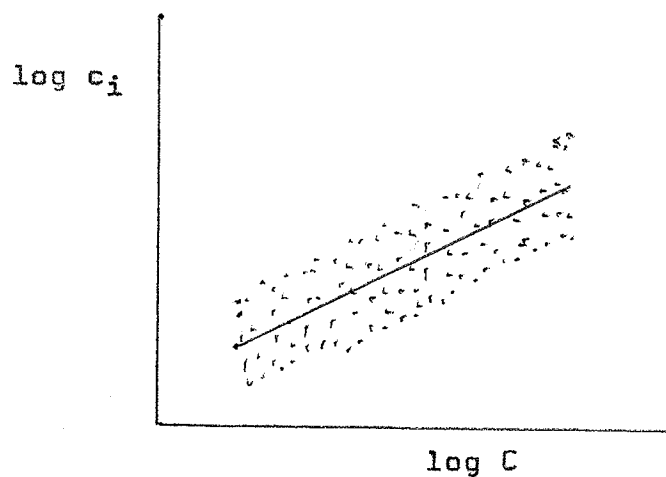


Figure III-B

Homoscedasticity: variability is constant as $\log C$ increases

	<u>Total</u> <u>Expenditure</u>	<u>Income</u>
Marginal Propensity to Consume	$\frac{\partial c_i}{\partial C} = \beta_1 \frac{C}{c_i}$	$\frac{\partial c_i}{\partial Y} = \frac{\partial c_i}{\partial C} \frac{\partial C}{\partial Y}$ $= \beta_1 \frac{C}{c_i} \alpha_1$
Partial Elasticity	$\frac{\partial c_i}{\partial C} \frac{C}{c_i} = \beta_1$	$\frac{\partial c_i}{\partial Y} \frac{Y}{c_i} = \frac{\partial c_i}{\partial C} \frac{C}{c_i} \frac{\partial C}{\partial Y} \frac{Y}{C}$ $= \beta_1 \cdot \alpha_1 \frac{Y}{C}$

Thus the β_1 coefficient of the hypothesized Engel function can be read directly as the partial elasticity with respect to total expenditure. In other words, the double-logarithmic function forces the elasticity to be constant. Houthakker²⁵ noted that the limitation of constant elasticity can be satisfied only approximately and over limited ranges of total expenditure. Houthakker used estimated elasticities to infer differences in consumption behaviour. The discussion of the results in Chapter VI considers the difference in elasticities (and the difference in the rank of the elasticity) to indicate

²⁵H. S. Houthakker, "An International Comparison of Household Expenditure Patterns, Commemorating the Centenary of Engel's Law," Econometrica, Vol. 25, No. 4 (October, 1957), pp. 532-551.

differences in consumption behaviour between degrees of urbanization.

CHAPTER IV

IMPACT OF INCREASE IN INCOME ON LEVEL OF LIVING

For each of the three approaches presented in Chapter III, Section A, a qualitative discussion of the impact of an increase in income on the level of living is now presented. A quantitative analysis of the impact of an income increase on consumption expenditures is developed later.

A) APPROACH OF UNITED NATIONS' REPORT

In terms of the approach of the United Nations' Report, an increase in income constitutes an increase in the level of living because some components are increased and no components are decreased. An increase in income allows a potential direct increase only in those components which can be obtained solely in the marketplace. Thus, food, clothing, and aggregate consumption and savings are the only components for which the potential of a direct increase exists.

An increase in income facilitates a partial increase in some of the other components which cannot be purchased completely in the marketplace. For example, health, education, transportation, and recreation and entertainment all contain non-purchasable characteristics such that an

increase in income cannot cause an increase in certain aspects of these components. The remaining components (conditions of work, employment situation, social security, and human freedoms) can be increased only indirectly by an increase in income.

Thus it is seen that although an increase in income implies an increase in the level of living, not all components are affected proportionately nor are all components necessarily affected.

B) PIPPING'S APPROACH

As has been stated above, an increase in income can only directly satisfy aspects of the level of living if this aspect can be purchased in the marketplace.

The family is an aspect of the level of living concerned with a pleasant family life. Income can alter this aspect only by way of its influence on other aspects of the level of living.

An increase in income is often acquired by an increase in working-time which causes a decrease in leisure-time. However, even though the increase in income is not the product of increased working-time (for example, the increase in income may come from increased transfers, an increase in the wage rate, or a capital gain), working-time may still be altered. However, it cannot be assumed that an increase in leisure-time constitutes an increase

in the level of living.¹ For example, if a person is eligible for a pension only if he ceases to work and this forced leisure is not desired, then the work-leisure component of the level of living will be decreased.

C) MILLER'S APPROACH

Income is viewed by Miller et al. to be the prime determinant of a family's economic well-being. Therefore an increase in income is considered to increase a family's economic well-being. To the extent that income is expended on assets (which in this context include housing, consumer durables, savings, and pension plans), an increase in income will increase the assets component of the level of living.

An increase in income will not directly alter the basic services component of the level of living (although it will directly increase the private aspects of such services as education and legal services). An indirect effect may be envisioned if more services are provided as a result of increased tax collections.

There is little impact on social mobility due to an increase in income. To the extent that an increase in income will increase the receipt of education and to the extent that education increases social mobility, an

¹James Lorimer and Myfanwy Phillips, Working People (Toronto: James Lewis and Samuel, 1970), p. 55.

increase in income will increase social mobility. An increase in income does not imply an improvement in political position. Ethnically, political position cannot be purchased, although one with more money may receive (or feels he receives) better treatment from legislative and administrative agencies.

As outlined on page 31, an increase in income that is stigmatized lowers the status and satisfaction component of the level of living.

D) SUMMARY

In general, an increase in income allows a direct increase in those aspects of the level of living which can be purchased² such as the food and clothing components. An increase in income directly enables an increase in aggregate consumption and saving (as noted in both the approaches of the United Nations' Report and of Pipping) and a direct increase in the income aspect of Miller et al.

Only a partial increase in other aspects of the level of living can potentially arise due to an increase in income. Components (of the approach of the United Nations' Report) which are not wholly satisfied by expenditures in

²In terms of economic theory, an increase in income defines an increase in utility due to increases in consumption or saving. For example, see Nissan Liviatan and Don Patinkin, "On the Economic Theory of Price Indexes," Economic Development and Cultural Change, Vol. IX, No. 3 (April, 1961), p. 530.

the marketplace include health, education, transportation, and recreation and entertainment.

An indirect positive (although perhaps negligible) impact occurs in the case of other aspects of the level of living as a result of an increase in the level of income. Such components as conditions of work, employment situation, social security, and human freedoms are examples. In Miller's terms, a similar impact exists in the case of assets, basic services, social mobility, and political position.

The possibility of a negative impact exists in two cases. If an increase in leisure-time results from an income increase and this increase in leisure is not wanted, it is a case of a negative impact on the level of living due to an increase in income. If the recipient of the increase in income feels that it is stigmatized, there is a negative impact on the level of living.

CHAPTER V

DATA FOR INTERLAKE AREA

This chapter describes the data for the Interlake Area. These data were used in the consumption expenditure analysis of Chapters VI and VII. This analysis is important for the discussion of the consumption aspect of each component of the level of living. The income variable is defined in Section B of this chapter and the consumption categories are defined in Section C.

A) DESCRIPTION OF DATA

The Interlake Area is 11,000 square miles located between Lake Winnipeg and Lake Manitoba with its southern boundary on the northern edge of Metropolitan Winnipeg.¹ The population of the area in 1968 was 49,690 as indicated in Table V-A. Table V-B shows the number of households by urbanization class in 1968.

¹Specifically, this study adopted the definition of the Interlake Area used in The Interlake Fact. Data from the following Rural Municipalities and Local Government Districts were used: Armstrong, Bifrost, Coldwell, Eriksdale, Fisher, Gimli, Grahamdale, Rockwood, Rosser, St. Andrews, St. Laurent, Siglunes, and Woodlands. See Charles F. Framingham, James A. MacMillan, and David J. Sandell, The Interlake Fact (Winnipeg: University of Manitoba, Department of Agricultural Economics, 1970), p. xviii.

TABLE V-A
POPULATION OF INTERLAKE - 1968

Rural	30,300
- Farm	20,915
- Non-farm	9,385
Urban	19,390
Total	49,690

Source: Charles F. Framingham, James A. MacMillan, and David J. Sandell, The Interlake Fact (Winnipeg: University of Manitoba, Department of Agricultural Economics, 1970), p. 1, Table 1.

TABLE V-B
NUMBER OF INTERLAKE HOUSEHOLDS - 1968

Rural	9,407
- Farm	5,917
- Non-farm	3,490
Urban	5,325
Total	14,732

Source: Ibid., p. 21, Table 7.

During the summer of 1969 the Department of Agricultural Economics at the University of Manitoba conducted a detailed survey of household expenditures and receipts for the 1968 calendar year. The methods of sampling and enumeration are described in Seminar on the Evaluation of the Manitoba Interlake Area Development Plan.²

The population of 14,732 households was stratified by municipality (of which there are 13 in the Interlake Area) and by degree of urbanization (rural farm, rural non-farm, and urban). The farm households were further stratified by farm size where farms with more than 19 acres and less than 240 were classified as small farms, farms with 240 to 759 were classified as medium farms, and farms with 760 or more acres were classified as large farms. Urban households were defined as households residing in centers with a population greater than 350. The category of rural non-farm households included all other households (that is, households which did not operate a farm and were not situated in an urban center).³

Consequently, consumption functions and Engel

²J. A. MacMillan and C. F. Framingham (eds.), Seminar on the Evaluation of the Manitoba Interlake Area Development Plan (Winnipeg: University of Manitoba, Department of Agricultural Economics, 1969).

³Charles F. Framingham, James A. MacMillan, and David J. Sandell, op. cit., pp. xx-xxi. Households which operated farms but were situated in an urban center were classified as farm households.

curves for five urbanization classes (corresponding to small farm, medium farm, large farm, rural non-farm, and urban) were estimated. Note that this incorporated an implicit hypothesis that there was a difference in household consumption behaviour due to farm size. The stratification by municipality of the urbanization classes was taken into account by using a weighting factor.⁴

⁴The sample observations within each urbanization group could not be simply added across municipalities because the final ratio of sample observations to total population was not the same in each municipality. The final sampling ratios are shown in Appendix A. The formulas below show the weighting procedure for α_0 and α_1 in the consumption function:

$$\alpha_0 = \frac{\sum_{h=1}^{13} \sum_{j=1}^{n_h} C_{hj}}{N} \quad \text{and}$$

$$\alpha_1 = \frac{\sum_{h=1}^{13} \frac{W_h^2 (1 - f_h)}{n_h (n_h - 1)} \sum_{j=1}^{n_h} (C_{hj} - \bar{C}_h) (y_{hj} - \bar{y}_h)}{\sum_{h=1}^{13} \frac{W_h^2 (1 - f_h)}{n_h (n_h - 1)} \sum_{j=1}^{n_h} (y_{hj} - \bar{y}_h)^2}$$

where $W_h = \frac{N_h}{N}$ is the stratum weight; N_h is the total number of households in stratum h , and N is the total number of households in the Interlake Area; n_h is the number of households in sample of stratum h ; $\bar{C}_h$ is the sample mean of household consumption C_h of stratum h ; $\bar{y}_h$ is the sample mean of household total income y_h of stratum h ; and $f_h = \frac{n_h}{N_h}$ is the stratum sampling fraction. For the derivation of these formulas see William G. Cochran, Sampling Techniques (New York: John Wiley and Sons, 1953), p. 202.

A consumption function of the form developed in Chapter III was estimated. Total consumption expenditure for each household was defined as the actual expenditure for household goods and services in 1968. However, whereas annual dollar expenditure on motor vehicles and homes is highly variable between years, the cost of private transportation and the cost of housing included an imputed value of depreciation.⁵

Total household income was defined as the sum of the returns from human wealth, the returns from non-human wealth, and transfer payments received from public and private sources.

B) MEASUREMENT OF INCOME

Total household income (Y) was estimated by summing:

- 1) current labour earnings (plus return to management

⁵For the case of motor vehicles, an imputed depreciation charge of 10 percent was added to the operating expenses of the vehicle(s) for the calculation of cost of private transportation. See Charles F. Framingham, James A. MacMillan, and David J. Sandell, op. cit., p. xvi.

For the case of tenants, the cost of housing was calculated as the sum of the actual rent paid and the expenditure on fuel, utilities, and repairs.

For the case of owner-occupied dwellings, the cost of housing was taken to be the larger of the opportunity cost approach (A) or the actual expenses plus depreciation approach (B).

Approach A: sum of six percent of the value of the house and housing operating expenditures.

Approach B: sum of depreciation (imputed at five percent of the value of the house), taxes, mortgage interest, repair and maintenance (expenditures over \$300 were assumed to be capital improvements), insurance, utilities, and fuel. See *ibid.*, p. xvi.

for self-employed persons);⁶

2) annuitized net worth, as defined in Chapter III, page 36;⁷ and

3) current receipts of public and private transfers (such as manpower training allowances, old age and veteran's pension, family allowance, workman's compensation, and unemployment insurance).

The measurement of current labour (plus management) earnings was especially difficult for farm households because:

1) farm cash income does not measure the total return earned by the farm enterprise; and

2) the returns to capital, labour, and management are intermixed.

In order to include non-cash returns to the farm enterprise, the calculated net farm income (explained below) includes imputed values for farm perquisites such as meat, dairy and poultry products, fruits and vegetables from a garden, and wood for fuel.⁸ The separation of the returns

⁶Note that income such as dividends, interest, property rental, and sale of assets was not included.

⁷The interest rate of six percent was chosen as being typical for the year 1968. The life expectancy of the head of the household was obtained from the Dominion Bureau of Statistics, Provincial and Regional Life Tables (Ottawa: Queen's Printer, 1964).

⁸Fruits, vegetables, clothing, and wood produced by the rural non-farm and urban households were also included in their respective total income variables.

to labour and management and the return to capital is explained below.

This study adopted the calculation of net farm income that is used in the Prairie Provinces Farm Account Book.⁹ Total farm household income was calculated as follows:

	<u>Total Operating Receipts</u>
plus:	net increase in inventories
	or
minus:	net decrease in inventories
plus:	value of produce used in home
minus:	value of seed purchased, grain and supplies purchased for resale
minus:	feed and livestock purchased
equals:	<u>Gross Profit</u> (value of farm production)
minus:	Total Operating Expenses ¹⁰

⁹ Departments of Agriculture of Alberta and Manitoba and University of Manitoba, Prairie Provinces Farm Account Book (Winnipeg: Queen's Printer, 1967).

¹⁰ The allocation of certain farm expenses between the farm household and the farm business presented some problems. With regard to bulk fuel and vehicle expenses, the survey enumerator was to ask for an estimate of the percentage use accruing to the household. If the household percentage use of the automobile was not indicated, it was specified to be 66.7 percent. The farm household and farm business shares of the expenditure for utilities (electricity, telephone) were to be ascertained by the enumerator. This often was not done and the total utility expenditure was entered as a farm expense. Thus the cost of farm housing is biased downward. The household share of the farm taxes was calculated by multiplying farm taxes by $(15 \div \text{size of farm})$. This calculation was based on the assumption that the typical farmstead is 15 acres.

equals: Returns above Total Operating Expenses
 minus: depreciation on: farm home (farm share)
 buildings
 machinery
 equals: Net Farm Earnings (return to farm family
 for labour, management, equity investment,
 and borrowed capital)
 minus: interest paid¹¹
 equals: Net Farm Income (return to farm family for
 labour, management, and equity investment)
 minus: imputed return to equity investment¹²
 equals: Returns to Labour and Management
 plus: non-farm earned income
 equals: Farm Household Earned Income
 plus: transfer income
 plus: annuitized net worth
 equals: Total Farm Household Income

C) CATEGORIZATION OF TOTAL CONSUMPTION

The total consumption expenditure was divided into categories on the basis of two guidelines. Categories that were relatively independent (that is, categories in which the expenditure was not largely determined by the expenditure in another category) were required. Categories that concern significant aspects of the level of living were

¹¹It was assumed that one-third of the interest payments on a house mortgage was a farm business expense and two-thirds were a housing expense.

¹²This value was calculated by taking six percent of farm net worth.

desired. The expenditure in each category was then treated as the dependent variable in the Engel curve function.

Engel curves for the following categories of consumption expenditure were estimated:

1) home-produced goods--household value (as estimated by the respondent) of the following home-produced goods in 1968: beef, pork, chicken, fish, other meat products, milk, cream, butter, cheese, eggs, garden fruits and vegetables, honey, clothing, and wood.

2) food--household expenditure in 1968 for meat, poultry and dairy products, fruits and vegetables, grain products, sugar products, and non-alcoholic beverages.

3) clothing--household expenditure in 1968 for clothing, footwear, yard goods, and textiles.

4) public transportation--household expenditure in 1968 for the non-recreational use of public transportation services.

5) private transportation--household share of expenditure in 1968 for the operating expenses, license, insurance, repairs, and depreciation (imputed at 10 percent of value) of privately-owned vehicles. (It was assumed that vehicles purchased in 1968 were owned for one-half of the year and they were thus depreciated for one-half of the year.)

6) alcohol--household expenditure in 1968 for alcoholic beverages.

7) tobacco--household expenditure in 1968 for tobacco.

8) education and reading materials--household expenditure in 1968 on tuition fees, room and board when attending school, and school supplies, plus expenditure for magazines, books, and newspapers.

9) medical--household expenditure in 1968 on medical and hospital insurance, medical and hospital expenses not covered by insurance (including dentist and optometrist) and drugs.

10) housing--the calculation of cost of housing was explained in footnote 5, page 52 of this chapter.

11) household equipment--household expenditure in 1968 for furniture, appliances, drapes, and rugs.

12) recreation and entertainment--household expenditure in 1968 for items such as vacations, hobbies, movies, dances, and hunting and fishing expenses.

13) other services and supplies--household expenditure in 1968 for miscellaneous items such as meals purchased outside the home, clothing and household cleaning services and supplies, toiletries, and gifts.

14) room and board--expenditure in 1968 by a wage-earner in the family for room and board outside the home.

Total consumption was calculated by adding the 14 categories together. The results of the Engel curve analysis for these categories are detailed in Chapter VI.

CHAPTER VI

RESULTS

This chapter presents the results of the consumption function and Engel curve relationships for the Interlake Area. These results are discussed in relation to the components of the level of living in Chapter VII.

As an introduction to the nature of the expenditure pattern in the Interlake Area, Table VI-A shows the percent of households with expenditures in each category.¹ The percent of households reporting room and board expenditures was very small which suggested that a meaningful Engel curve cannot be estimated for this category. The rural non-farm group has a relatively larger number of households being supported by a wage-earner who lived away from home for at least part of the year.

The percent of households reporting expenditure in the public transportation category is also low. Again,

¹Table VI-A also shows the percent of households with positive income values. In the case of total earned income for the farm categories, the table shows the percent of farms with a positive value for the sum of the return to labour and management calculation and non-farm earned income. Total earned income for rural non-farm and urban households cannot be negative, by definition. Therefore, a non-positive response indicates a zero response which points out that the income received by these rural non-farm and urban households consisted of transfer payments and the return from non-human wealth. (Recall that total earned income includes the value of home-produced goods.)

TABLE VI-A
PERCENT OF HOUSEHOLDS IN SAMPLE WITH
POSITIVE REPLIES BY CATEGORY^a

	Small Farm	Medium Farm	Large Farm	Rural Non-farm	Urban
Home-Produced Goods	84.4	87.2	93.6	51.7	43.1
Food	99.0	99.6	100.0	95.6	98.6
Clothing	99.0	100.0	100.0	100.0	99.5
Public Transportation	29.2	27.4	30.2	41.1	36.7
Private Transportation	89.6	98.3	100.0	60.6	77.5
Alcohol	68.8	73.1	81.0	62.2	74.3
Tobacco	66.7	61.1	54.0	56.7	72.5
Education, Reading	95.8	91.9	93.6	83.3	93.1
Medical	95.8	97.9	99.2	85.6	95.0
Housing	100.0	100.0	100.0	95.6	99.5
Household Equipment	74.0	78.2	81.8	57.8	72.9
Recreation, Entertainment	65.6	79.5	88.9	70.6	82.6
Other Services, Supplies	99.0	100.0	100.0	100.0	100.0
Room and Board	2.1	0.8	2.4	8.3	3.2
Total Earned Income	71.9	65.4	61.1	82.2	92.7
Transfer Income	68.8	69.2	77.8	81.1	80.7
Annuitized Net Worth	99.0	100.0	100.0	98.9	98.6

^aThese percentages should not be strictly applied to the Interlake Area because the relative differences in the sampling ratio for each municipality have not been taken into account in this table. For the final sample size by municipality, see the appendix.

meaningful Engel curves were not expected in this category. Public transportation services in the Interlake Area consisted of buses and taxis in 1968.

Table VI-B presents the estimated mean value of the variables under consideration. The estimated mean of total earned income for the farm groups decreases as farm size increases. This is likely due to the fact that an imputed return to capital (which increases as farm size increases) was subtracted from net farm income to obtain the returns to labour and management.

Table VI-C shows the results of the estimated consumption functions. The coefficient associated with the income (Y) variable shows the increase in household aggregate consumption expenditure that would result from a unit increase in income. This is the marginal propensity to consume which was defined on page 33. The coefficient associated with the family size (N) variable shows the increase in household aggregate consumption expenditure that would result from a unit increase in family size. For example, in the case of the small farm household, this function predicts that an increase in aggregate consumption expenditure of \$37.94 will result from an increase in family size of one person for one month.

The R^2 or coefficient of determination indicates the proportion of the variance in total consumption (C) explained by the linear influence of income (Y) and family

TABLE VI-B
MEAN VALUE OF VARIABLES^a

	Small Farm	Medium Farm	Large Farm	Rural Non-farm	Urban
Home-Produced Goods	220.07 (2.62)	399.45 (1.40)	469.93 (2.70)	69.84 (0.70)	51.20 (0.48)
Food	913.29 (5.27)	841.28 (1.77)	942.87 (3.72)	826.34 (3.48)	1237.21 (3.46)
Clothing	326.88 (2.32)	379.25 (1.14)	433.32 (2.24)	285.22 (1.91)	395.56 (1.66)
Public Transportation	25.28 (0.55)	12.22 (0.18)	16.86 (0.32)	27.76 (0.33)	31.01 (0.39)
Private Transportation	279.17 (2.91)	344.58 (1.35)	365.25 (2.96)	414.32 (2.93)	486.44 (2.08)
Alcohol	73.77 (1.12)	66.14 (0.40)	104.27 (1.29)	117.86 (1.31)	107.44 (1.20)
Tobacco	116.12 (1.29)	90.55 (0.45)	70.85 (0.73)	108.13 (1.00)	121.63 (0.68)
Education, Reading	44.16 (0.85)	88.58 (1.20)	65.08 (1.49)	51.17 (7.63)	122.85 (1.06)
Medical	184.40 (2.02)	204.31 (0.64)	221.86 (1.22)	176.41 (1.87)	229.19 (0.79)
Housing	606.31 (5.42)	562.15 (1.66)	624.88 (3.48)	703.16 (2.56)	1228.69 (4.15)
Household Equipment	167.23 (3.92)	173.50 (1.26)	156.57 (1.74)	123.74 (1.65)	196.15 (1.36)
Recreation, Entertainment	91.56 (2.29)	97.53 (0.86)	147.74 (1.55)	141.14 (2.61)	225.29 (1.51)
Other Services, Supplies	366.55 (3.33)	360.85 (1.88)	376.15 (2.58)	347.75 (2.06)	506.44 (2.53)
Room and Board	33.12 (2.99)	5.13 (0.22)	23.97 (1.09)	47.84 (0.96)	29.47 (0.40)
Total Consumption	3447.96 (20.03)	3625.59 (6.59)	4019.67 (13.48)	3440.68 (13.88)	4968.56 (13.87)

TABLE VI-B (continued)

	Small Farm	Medium Farm	Large Farm	Rural Non-farm	Urban
Total Earned Income	1934.31 (40.18)	1423.68 (15.43)	875.36 (47.83)	3034.01 (20.73)	5128.29 (23.39)
Total Transfer Income	456.62 (7.89)	442.18 (2.93)	421.87 (4.83)	915.96 (5.95)	743.58 (5.40)
Annuitized Net Worth	2323.86 (22.95)	3623.42 (1030.85)	5252.66 (28.06)	1073.66 (7.06)	1340.77 (12.64)
Total Income	4714.80 (50.30)	5489.27 (18.84)	6549.89 (51.56)	5023.63 (22.32)	7212.64 (27.64)
Family Size ("person equi- valents")	37.49 (0.26)	47.41 (0.11)	50.18 (0.20)	32.05 (0.15)	43.14 (0.12)

^aStandard deviations of means are in parentheses.

TABLE VI-C
CONSUMPTION FUNCTIONS^a

	constant	Y	N	R ²
Small Farm	1213.74 (248.14)**	0.1722 (0.0285)**	37.94 (5.52)**	0.64
Medium Farm	2037.89 (187.58)**	0.1565 (0.0195)**	15.37 (3.24)**	0.32
Large Farm	2256.02 (312.62)**	0.0246 (0.0214)	31.94 (5.53)**	0.26
Rural Non-farm	523.89 (204.44)**	0.3322 (0.0297)**	38.94 (4.34)**	0.69
Urban	843.31 (180.14)**	0.4012 (0.0146)**	28.55 (3.27)**	0.84

^aStandard errors of estimate are in parentheses.

**Regression coefficients are significant at the one percent level for the one-tailed "t" test.

size (N).² The hypothesized consumption function explained the largest amount of the variation in total consumption of urban households ($R^2 = 0.84$). The R^2 was lower for medium and large farm households than for the urban households.

The marginal propensity to consume for the farm groups (less than 0.17) was low relative to the non-farm groups (greater than 0.33). This was hypothesized to be the case due to the competing factor of farm business investments. Another reason for a relatively low farm household marginal propensity to consume was that a calculated current farm income was not a significant determinant of farm household consumption expenditure. This was likely due to the fact that farm incomes tend to vary considerably between years. Thus the calculated net farm income for a single year tended to be less correlated with household consumption expenditure. Therefore, the importance of income for predicting farm household consumption tended to be less than for the non-farm households.

Thus in terms of Keynes' hypothesis, the more variable (that is, the less stable) the income (and also, the larger the farm size), the smaller was the amount of the variance of consumption explained by current income.

²J. Johnston, Econometric Methods (New York: McGraw-Hill, 1963), p. 31.

The marginal propensity to consume was greater than zero but less than one for all urbanization groups.

The results of the Engel curve analysis are presented in Table VI-D. As noted in Chapter III, page 41, the functional form is double-logarithmic and the coefficients can be read directly as partial elasticities. Taking the food category in the small farm urbanization group as an example, a one percent increase in total consumption expenditure (C) will cause a 0.5053 percent increase in food expenditure. Similarly, a one percent increase in family size will result in a 0.5434 percent increase in food expenditure.

As was expected, insignificant Engel functions were obtained for the room and board category and for public transportation.

In general, neither the total expenditure elasticity nor the family size elasticity remained constant as the degree of urbanization changed. That is, differences in consumption behaviour between urbanization groups were prevalent. In fact, only the total expenditure and family size elasticities for food, the family size elasticity for housing, and the total expenditure and family size elasticities for the residual category (other services and supplies) showed no marked differences between the various degrees of urbanization.

TABLE VI-D
ENGEL CURVES^a

	constant	log C	log N	R ²
<u>Home-Produced Goods</u>				
Small Farm	4.0583 (2.3175)*	-1.2748 (0.6157)*	1.4287 (0.5899)**	0.06
Medium Farm	-0.2479 (1.6808)	-0.1818 (0.4563)	1.8709 (0.3070)**	0.16
Large Farm	-1.5875 (1.9533)	0.8035 (0.5148)	0.6663 (0.4049)	0.09
Rural Non-farm	0.6177 (1.8590)	-0.6227 (0.5069)	1.5900 (0.4379)**	0.09
Urban	3.6217 (1.7412)*	-1.3675 (0.4413)**	1.1754 (0.4289)**	0.05
<u>Food</u>				
Small Farm	0.2775 (0.8906)	0.5053 (0.2366)*	0.5434 (0.2267)**	0.28
Medium Farm	0.1055 (0.4219)	0.7187 (0.1145)**	0.1413 (0.0771)*	0.22
Large Farm	-0.0157 (0.4132)	0.7851 (0.1089)**	0.0808 (0.0857)	0.43
Rural Non-farm	0.5980 (0.9861)	0.2272 (0.2688)	0.9220 (0.2323)**	0.20
Urban	0.6038 (0.3112)*	0.5247 (0.0789)**	0.3029 (0.0767)**	0.41

^aValues in parentheses are standard errors of regression coefficients.

*Regression coefficients are significant at the five percent level for the one-tailed "t" test.

**Regression coefficients are significant at the one percent level for the one-tailed "t" test.

TABLE VI-D (continued)

	constant	log C	log N	R ²
<u>Clothing</u>				
Small Farm	-0.9711 (0.8189)	0.5454 (0.2176)**	0.9410 (0.2084)**	0.49
Medium Farm	-1.6326 (0.3011)**	1.0249 (0.0817)**	0.3098 (0.0550)**	0.57
Large Farm	-1.5773 (0.4046)**	1.0250 (0.1066)**	0.2821 (0.0839)**	0.64
Rural Non-farm	-1.4094 (0.3199)**	0.9024 (0.0872)**	0.4043 (0.0754)**	0.72
Urban	-2.8366 (0.4709)**	1.3397 (0.1193)**	0.2442 (0.1160)*	0.55
<u>Public Transportation</u>				
Small Farm	-2.0469 (2.2454)	1.0779 (0.5966)*	-1.1087 (0.5716)*	0.04
Medium Farm	-0.7517 (1.3099)	0.4478 (0.3556)	-0.5427 (0.2393)*	0.02
Large Farm	-0.8049 (1.8822)	0.1910 (0.4961)	0.0918 (0.3902)	0.004
Rural Non-farm	1.8352 (1.7452)	-0.5372 (0.4758)	0.2112 (0.4111)	0.008
Urban	-1.1280 (1.6112)	0.4281 (0.4084)	-0.1377 (0.3969)	0.006
<u>Private Transportation</u>				
Small Farm	-5.2455 (1.4828)**	2.1086 (0.3939)**	-0.0226 (0.3774)	0.38
Medium Farm	-2.2806 (0.6171)**	1.4124 (0.1675)**	-0.2044 (0.1127)*	0.24
Large Farm	0.0770 (0.7913)	0.7810 (0.2086)**	-0.2795 (0.1640)*	0.10
Rural Non-farm	-12.7316 (1.6864)**	3.9030 (0.4598)**	0.4612 (0.3972)	0.51
Urban	-10.7662 (1.7518)**	3.8452 (0.4440)**	-0.8201 (0.4315)*	0.30

TABLE VI-D (continued)

	constant	log C	log N	R ²
<u>Alcohol</u>				
Small Farm	0.4036 (2.9242)	-0.1641 (0.7769)	0.8163 (0.7444)	0.02
Medium Farm	-5.2978 (1.4862)**	2.3390 (0.4035)**	-1.1619 (0.2715)**	0.14
Large Farm	-6.5950 (2.5732)**	2.6506 (0.6782)**	-0.9037 (0.5334)*	0.11
Rural Non-farm	-6.7720 (1.9484)**	2.7016 (0.5312)**	-1.1072 (0.4589)**	0.14
Urban	-6.4438 (1.5268)**	2.0989 (0.3870)**	0.0164 (0.3761)	0.18
<u>Tobacco</u>				
Small Farm	2.1988 (3.2846)	-1.4610 (0.8726)*	2.7014 (0.8361)**	0.11
Medium Farm	-4.7271 (1.8823)**	1.6835 (0.5110)**	-0.1194 (0.3438)	0.05
Large Farm	-3.6985 (2.8171)	1.1669 (0.7425)	0.2015 (0.5840)	0.04
Rural Non-farm	-7.5069 (1.9464)**	2.2029 (0.5307)**	0.5836 (0.4585)	0.24
Urban	-7.1628 (1.6184)**	2.1990 (0.4102)**	0.3324 (0.3986)	0.21
<u>Education, Reading</u>				
Small Farm	-2.0954 (1.1743)*	0.7798 (0.3120)**	0.4171 (0.2989)	0.23
Medium Farm	-6.3339 (1.0847)**	2.0127 (0.2944)**	0.3646 (0.1981)*	0.24
Large Farm	-4.7699 (1.4042)**	1.4610 (0.3701)**	0.5641 (0.2911)*	0.26
Rural Non-farm	-4.4140 (1.0700)**	1.8354 (0.2917)**	-0.6048 (0.2520)**	0.22
Urban	-4.7987 (0.7962)**	1.5162 (0.2018)**	0.5196 (0.1961)**	0.40

TABLE VI-D (continued)

	constant	log C	log N	R ²
<u>Medical</u>				
Small Farm	-4.7440 (1.5443)**	2.1176 (0.4103)**	-0.3807 (0.3931)	0.31
Medium Farm	-2.2591 (0.6606)**	1.1010 (0.1793)**	0.3296 (0.1207)**	0.24
Large Farm	0.4958 (0.8326)	0.2214 (0.2194)	0.5691 (0.1726)**	0.17
Rural Non-farm	-8.9473 (1.3267)**	3.3912 (0.3617)**	-0.7394 (0.3125)**	0.42
Urban	-3.0686 (0.8357)**	1.4382 (0.2118)**	-0.0238 (0.2058)	0.25
<u>Housing</u>				
Small Farm	-2.1733 (0.7305)**	1.4897 (0.1941)**	-0.2437 (0.1860)	0.51
Medium Farm	-0.1528 (0.3699)	0.7752 (0.1004)**	0.0545 (0.0676)	0.26
Large Farm	-1.7447 (0.6271)**	1.3596 (0.1653)**	-0.2572 (0.1300)*	0.40
Rural Non-farm	0.0701 (0.9693)	0.5912 (0.2643)*	0.3524 (0.2283)	0.13
Urban	-0.4267 (0.2929)	0.9243 (0.0742)**	0.0406 (0.0722)	0.55
<u>Household Equipment</u>				
Small Farm	-2.8940 (2.9508)	0.1669 (0.7840)	2.3954 (0.7512)**	0.20
Medium Farm	-4.3449 (1.8157)**	1.4982 (0.4929)**	0.2943 (0.3317)	0.06
Large Farm	-3.4536 (2.4489)	1.2194 (0.6454)*	0.3884 (0.5076)	0.07
Rural Non-farm	-6.4516 (2.0574)**	1.9868 (0.5610)**	0.3401 (0.4846)	0.16
Urban	-8.7135 (1.5150)**	2.3850 (0.3840)**	0.8971 (0.3732)**	0.32

TABLE VI-D (continued)

	constant	log C	log N	R ²
<u>Recreation, Entertainment</u>				
Small Farm	-4.8646 (2.6653)*	0.9447 (0.7081)	1.6747 (0.6785)**	0.22
Medium Farm	-3.8274 (1.5476)**	1.5067 (0.4201)**	-0.1263 (0.2827)	0.06
Large Farm	-3.7524 (1.8987)*	1.8379 (0.5004)**	-0.7181 (0.3936)*	0.10
Rural Non-farm	-9.6292 (1.6602)**	4.0087 (0.4526)**	-2.1989 (0.3910)**	0.31
Urban	-11.3569 (1.2704)**	3.7991 (0.3220)**	-0.5545 (0.3129)*	0.47
<u>Other Services, Supplies</u>				
Small Farm	-1.3186 (0.9624)	0.9877 (0.2557)**	0.1657 (0.2450)	0.30
Medium Farm	-2.5657 (0.3432)**	1.4571 (0.0932)**	-0.0887 (0.0627)	0.55
Large Farm	-2.1469 (0.5887)**	1.3414 (0.1552)**	-0.1222 (0.1220)	0.45
Rural Non-farm	-1.4097 (0.3988)**	1.0495 (0.1087)**	0.0800 (0.0939)	0.56
Urban	-2.1353 (0.3281)**	1.3319 (0.0832)**	-0.1084 (0.0808)	0.64
<u>Room and Board</u>				
Small Farm	-1.3991 (1.0564)	0.5754 (0.2806)*	-0.7469 (0.2689)**	0.08
Medium Farm	-0.4655 (0.4139)	0.0376 (0.1124)	-0.1495 (0.0756)*	0.02
Large Farm	-0.8995 (1.1429)	0.0657 (0.3012)	0.0901 (0.2369)	0.004
Rural Non-farm	-0.8586 (1.2124)	0.5690 (0.3306)*	-1.0155 (0.2856)**	0.07
Urban	-0.5309 (0.4122)	0.0572 (0.1044)	-0.1069 (0.1015)	0.005

Houthakker³ noted that the partial elasticity for family size incorporates two different effects. The "specific" effect denotes the increase in consumption due to the increase in need caused by the increase in family size. The other effect, metaphorically termed by Houthakker as the "income" effect, denotes the fact that an increase in family size makes each family member relatively poorer. For example, an increase in family size may increase a household's "need" for, say, clothing but the simultaneously arising "need" for more food may force the household to spend less for clothing on balance. Houthakker also noted that since the family size elasticity is a partial elasticity, it is assumed that total expenditure is not altered. Thus the total effect of a change in family size on all expenditures must be zero (that is $\sum_{i=1}^n \beta_{2i} c_i = 0$). Consequently, not all the family size partial elasticities can be positive, nor can they all be negative.

There are few other estimates of elasticity by consumption category with which to compare the results of this study. No studies were found which provided a rural-urban comparison.

Houthakker⁴ undertook an international comparison

³H. S. Houthakker, "An International Comparison of Household Expenditure Patterns, Commemorating the Centenary of Engel's Law," Econometrica, Vol. 25, No. 4 (October, 1957), pp. 532-551.

⁴Ibid.

of household expenditure patterns. He considered only food, clothing, housing, and all other expenditures. He concluded that the partial elasticity of food with respect to total expenditure is approximately 0.6, clothing is approximately 1.2, and housing is approximately 0.8. The partial elasticity of food with respect to family size is approximately 0.3 and about zero for housing and clothing.

The data for Houthakker's estimates for Canada were obtained from a survey by the Dominion Bureau of Statistics of urban households in 1947.⁵ His results for Canada were:

	<u>Partial Elasticity</u>	
	<u>Total Expenditure</u>	<u>Family Size</u>
Food	0.647 (0.008)	0.292 (0.007)
Clothing	1.337 (0.092)	-0.114 (0.081)
Housing	1.114 (0.043)	-0.447 (0.038)

The urban total expenditure partial elasticity for food in the Interlake Area in 1968 was 0.5247 and the family size partial elasticity was 0.3029. These (especially the latter) were remarkably close to Houthakker's estimates for 1947. The smaller total expenditure partial elasticity in 1968 could be explained by the fact that total consumption increased by more than food in the interval 1947

⁵ Dominion Bureau of Statistics, "Canadian Non-farm Family Expenditures, 1947-48, Reference Paper No. 42," (Ottawa: Queen's Printer, June, 1953).

to 1968 and thus food became less important in the household budget.

The urban total expenditure partial elasticity for clothing in 1968 was 1.3397. This was nearly identical to Houthakker's estimate for urban Canada in 1947 of 1.337. However, Houthakker obtained a negative family size partial elasticity (-0.114) whereas the same elasticity for the Interlake Area in 1968 was positive (0.2442). In fact, the family size partial elasticity for clothing was positive (and significant) for all urbanization groups in the Interlake Area. This suggests that the "income" effect was larger than the "specific" effect (see page 71) in 1947 but that in 1968, an increase in family size allowed an increase in expenditure on clothing (that is, it did not force a reduction in the expenditure on clothing).

The total expenditure partial elasticity of housing in urban Canada in 1947 was 1.114. This does not differ markedly from the estimate (0.9243) obtained for the urban group in the Interlake Area for 1968. The slight decrease could be explained, as in the case of food, as the result of an increase in total consumption and thus the expenditure on housing has become relatively less important. The family size partial elasticity was negative (and significant) in 1947. However, this elasticity for urban households in the Interlake in 1968 was not significant from zero. Thus the relative importance of the "income"

effect to the "specific" effect has decreased since 1947.

Schweitzer⁶ has recently completed a time-series analysis of personal consumption expenditures in Canada for the period 1926-1975. He calculated total expenditure elasticities for many categories of consumer expenditure. His results for categories which are comparable to categories of this study are:

<u>Category</u>	<u>Total Expenditure Elasticity</u>			
	<u>Short-run</u>		<u>Long-run</u>	
	<u>$\bar{C}$</u>	<u>1966</u>	<u>$\bar{C}$</u>	<u>1966</u>
Food (excluding all beverages)	0.34	0.43	0.39	0.49
Alcoholic Beverages	0.88	0.90	0.94	0.96
Tobacco	0.22	0.23	0.66	0.68
Men's Clothing	1.95	2.49	0.14	0.17
Women's Clothing	1.17	1.15	0.76	0.75
Footwear	1.19	1.70	0.12	0.18
Entertainment, Recreation, and Cultural Services	0.83	1.19	1.07	1.54

The total expenditure elasticities for food obtained by Schweitzer fall within the range 0.2272-0.7851 obtained for Interlake Area households.

The total expenditure elasticities for alcohol and tobacco in the Interlake Area in 1968 were considerably

⁶Thomas T. Schweitzer, Personal Consumer Expenditures in Canada, 1926-1975 (Ottawa: Economic Council of Canada, Staff Study No. 26, 1969-1971), Parts I, II, and III.

higher (except for small farms, where both are negative) than the elasticities obtained by Schweitzer. Although various reasons for the difference can be suggested (such as differences in estimation techniques or the fact that the Interlake Area may not be representative of Canada as a whole in terms of alcohol and tobacco expenditure patterns), the reason for such a divergence was not ascertained.

The total expenditure elasticities for clothing in the Interlake Area ranged from 0.5454 to 1.3397. This approximates the range established by Schweitzer for short-run elasticities. However his long-run elasticities were considerably smaller. Schweitzer reasoned that "apparently Canadians spend heavily on this item (clothing) in years of large increases in total expenditure, but the long-term growth is quite moderate."⁷ This suggests that the elasticities for clothing obtained for the Interlake Area tend to estimate short-run phenomenon.

The total expenditure elasticities for recreation and entertainment in the Interlake Area ranged from 0.9447 to 4.0087. Schweitzer's estimates were considerably lower. A reconciliation was not attempted as comparison seemed impossible due to the fact that Schweitzer's data from the national accounts contained the cost of public recreation

⁷Ibid., Part I, p. 34.

and cultural services and was not merely household expenditure on recreation and entertainment.

However Schweitzer did not consider the differences in elasticities between urbanization groups. In fact, no studies of Canadian consumer behaviour were found which considered the differences in consumer behaviour due to degree of urbanization.

It has been shown above that total expenditure elasticities are, in general, different for each urbanization group. However, in order to ascertain whether there was a similar consumption pattern between any two groups, the consumption categories were ranked by their total expenditure elasticities.

A relatively low elasticity (that is, a small percentage increase in consumption of that category due to a one percent increase in total consumption) signifies a necessity. Conversely, a relatively high elasticity denotes a luxury good. A negative elasticity denotes an inferior good because an increase in total consumption causes a decrease in the consumption of that good. Thus, a difference in the ranking of consumption categories between urbanization groups will indicate a difference in consumption behaviour between urbanization groups. The aggregate expenditure elasticities are ranked in Table VI-E.

There was a similar ranking (except for household equipment and medical expenses) of aggregate consumption

elasticities for the rural non-farm and urban groups. This suggested that (except for the cases of household equipment and medical expenses, which are discussed below) there was no marked difference in the consumption pattern of the rural non-farm and urban households.

The ranking of the small and medium farms is somewhat similar, although the ranking for large farms is basically different. The ranking for the non-farm groups is entirely different from any of the farm groups. Therefore, there is a difference in consumption patterns between farm and non-farm households and there is also a difference in consumption patterns between households of different sized farms.

Home-produced goods are an inferior product (that is, the elasticity is negative) for all urbanization groups except large farms.

The ranking (and the absolute value) of the private transportation elasticity also decreased as farm size increased. This suggested that transportation becomes a relative necessity as farm size increases. The elasticity for private transportation for the rural non-farm and urban groups was relatively high. Private transportation is thus a relative luxury for these two groups.

Food and clothing maintained their ranking as relative necessities throughout the urbanization classes.

Household equipment is a category of durable home

TABLE VI-E
RANKING OF TOTAL EXPENDITURE ELASTICITIES

Small Farm		Medium Farm	
Consumption Category	Elasticity	Consumption Category	Elasticity
Tobacco	-1.4610*	Home-Produced Goods	-0.1818
Home-Produced Goods	-1.2748*	Room and Board	0.0376
Alcohol	-0.1641	Public Transportation	0.4478
Household Equipment	0.1670	Food	0.7187**
Food	0.5053*	Housing	0.7752**
Clothing	0.5454**	Clothing	1.0248**
Room and Board	0.5754*	Medical	1.1010**
Education, Reading	0.7798**	Private Transportation	1.4124**
Recreation, Entertainment	0.9447	Other Services, Supplies	1.4571**
Other Services, Supplies	0.9877**	Household Equipment	1.4982**
Public Transportation	1.0779*	Recreation, Entertainment	1.5067**
Housing	1.4897**	Tobacco	1.6835**
Private Transportation	2.1086**	Education, Reading	2.0127**
Medical	2.1176**	Alcohol	2.3390**

*Regression coefficients are significant at the five percent level for the one-tailed "t" test.

**Regression coefficients are significant at the one percent level for the one-tailed "t" test.

TABLE VI-E (continued)

Large Farm	
Consumption Category	Elasticity
Room and Board	0.0657*
Public Transportation	0.1910
Medical	0.2214
Private Transportation	0.7810**
Food	0.7851**
Home-Produced Goods	0.8035
Clothing	1.0250**
Tobacco	1.1669
Household Equipment	1.2194*
Other Services, Supplies	1.3414**
Housing	1.3596**
Education, Reading	1.4610**
Recreation, Entertainment	1.8379**
Alcohol	2.6506**

TABLE VI-E (continued)

Rural Non-farm		Urban	
Consumption Category	Elasticity	Consumption Category	Elasticity
Home-Produced Goods	-0.6227	Home-Produced Goods	-1.3675**
Public Transportation	-0.5372	Room and Board	0.0572
Food	0.2272	Public Transportation	0.4287
Room and Board	0.5690	Food	0.5247**
Housing	0.5912*	Housing	0.9243**
Clothing	0.9024**	Other Services, Supplies	1.3319**
Other Services, Supplies	1.0495**	Clothing	1.3397**
Education, Reading	1.8354**	Medical	1.4382**
Household Equipment	1.9868**	Education, Reading	1.5162**
Tobacco	2.2029**	Alcohol	2.0989**
Alcohol	2.7016**	Tobacco	2.1990**
Medical	3.3912**	Household Equipment	2.3850**
Private Transportation	3.9030**	Recreation, Entertainment	3.7991**
Recreation, Entertainment	4.0087**	Private Transportation	3.8452**

furnishings and appliances. It would be expected that this category was not as stable as other more necessary goods such as food, clothing, or housing. However, it was noted that the elasticity of household equipment tended to increase as total consumption increased between rural non-farm and urban households and between small and medium farm households.

Medical expenditure elasticities showed a marked decrease as consumption increased between small, medium, and large farm groups and between rural non-farm and urban households. The fact that medical expenditures became less important as total consumption increased was probably due to the fact that the major health expenditure in 1968 was a compulsory health insurance premium.

By using the formula for the partial income elasticity shown on page 41, partial income elasticities were calculated and ranked in Table VI-F. This table was prepared in order to determine if the income elasticity for any consumption category was the same for any or all urbanization groups. In general, this case did not exist. The income elasticities for the farm households were unrealistically low. This was primarily due to the fact that the elasticity of total expenditure with respect to income was low due to the previously mentioned estimation problems for consumption functions for farm households. Using the criterion that an income elasticity greater than

one denoted a luxury, the consumption categories which were luxuries for rural non-farm and urban households were tobacco, alcohol, private transportation, and recreation and entertainment. Medical services were a luxury for rural non-farm households while purchases of household equipment appeared as a luxury for urban households.

TABLE VI-F
RANKING OF INCOME ELASTICITIES^a

Small Farm		Medium Farm	
Consumption Category	Elasticity	Consumption Category	Elasticity
Tobacco	-0.3439	Home-Produced Goods	-0.0431
Home-Produced Goods	-0.3001	Room and Board	0.0089
Alcohol	-0.0386	Public Transportation	0.1061
Household Equipment	0.0343	Food	0.2466
Food	0.1189	Housing	0.2660
Clothing	0.1284	Clothing	0.3516
Room and Board	0.1354	Medical	0.3778
Education, Reading	0.1836	Private Transportation	0.4846
Recreation, Entertainment	0.2224	Other Services, Supplies	0.5000
Other Services, Supplies	0.2325	Household Equipment	0.5141
Public Transportation	0.2537	Recreation, Entertainment	0.5170
Housing	0.3507	Tobacco	0.5776
Private Transportation	0.4964	Education, Reading	0.6906
Medical	0.4985	Alcohol	0.8026
Total Consumption	0.2354	Total Consumption	0.2370

^aThe income elasticities were calculated by the formula shown on page 41.

TABLE VI-F (continued)

Large Farm	
Consumption Category	Elasticity
Room and Board	0.0026
Public Transportation	0.0076
Medical	0.0089
Private Transportation	0.0313
Food	0.0314
Home-Produced Goods	0.0322
Clothing	0.0410
Tobacco	0.0467
Household Equipment	0.0488
Other Services, Supplies	0.0537
Housing	0.0544
Education, Reading	0.0585
Recreation, Entertainment	0.0736
Alcohol	0.1062
Total Consumption	0.0400

TABLE VI-F (continued)

Rural Non-farm		Urban	
Consumption Category	Elasticity	Consumption Category	Elasticity
Home-Produced Goods	-0.3020	Home-Produced Goods	-0.7964
Public Transportation	-0.2605	Room and Board	0.0333
Food	0.1102	Public Transportation	0.2497
Room and Board	0.2760	Food	0.3056
Housing	0.2867	Housing	0.5383
Clothing	0.4377	Other Services, Supplies	0.7757
Other Supplies, Supplies	0.5090	Clothing	0.7802
Education, Reading	0.8902	Medical	0.8376
Household Equipment	0.9636	Education, Reading	0.8830
Tobacco	1.0684	Alcohol	1.2224
Alcohol	1.3103	Tobacco	1.2807
Medical	1.6447	Household Equipment	1.3890
Private Transportation	1.8930	Recreation, Entertainment	2.2126
Recreation, Entertainment	1.9442	Private Transportation	2.2394
Total Consumption	0.4850	Total Consumption	0.5824

CHAPTER VII

CONTRIBUTION TO LEVEL OF LIVING DUE TO A CHANGE IN RESPECTIVE CONSUMPTION CATEGORIES FOR INTERLAKE AREA HOUSEHOLDS

This chapter discusses the nature of the contribution to the level of living that would arise from a change in each consumption category.

The value of home-produced goods decreased as total consumption increased for all urbanization groups, except the large farm group. In fact, for small farms and for urban households, the aggregate consumption elasticity was less than -1.0 which means that the value of home produce will decrease by more than the increase in total consumption. In this case, an increase in aggregate consumption (which would result from an increase in income) will cause a proportionately larger reduction in the consumption of home produce. Thus it cannot be assumed in this case that an increase in income will increase the consumption components of the level of living. The level of living may still increase if the increase in the level of living due to an increase in leisure is greater than the decrease in the level of living due to a decrease in the consumption components.

The aggregate consumption elasticity for food ranged from 0.23 for rural non-farm households to 0.78 for

large farm households. Thus an increase in income will cause an increase in food expenditure. However, if this increase in food expenditure arose merely because of a decrease in home-produced food, then the food component of the level of living cannot be considered to have increased.

An increased expenditure on clothing, where the aggregate consumption elasticity ranged from 0.54 for small farm households to 1.34 for urban households, indicates an increase in the level of living due to an increase in income. However, the same reservation as was the case with the food category exists. That is, if an increase in expenditure on clothing is due to a decrease in the value of clothing made at home, then the clothing component of the level of living cannot be considered to have increased.¹

An increase in expenditure for non-recreational public transportation represents an increased travelling cost for the participation in given events (such as visiting the doctor, attending technical school, or shopping). If participation in this event causes an increase in the level of living, then the transportation expenditure associated with this event should be considered as contributing to the increase in the level of living. If, however, the event is (or is caused by) a decrease in the level of living (for example, a trip to the hospital

¹Factors such as climate and occupation must also be taken into account.

forced by illness), then the associated expenditure on public transportation should be considered as contributing to the decrease in the level of living.

Aggregate consumption elasticities for private transportation ranged from 0.78 for large farm households to 3.90 for rural non-farm households. An increased expenditure on private transportation provides an increase in quantity, quality, or both, of private transportation services. However, as stated above, if the expenditure on transportation is due to the participation in an event that causes a decrease in the level of living, the associated expenditure on transportation should be considered as contributing to the decrease in the level of living.

The aggregate consumption elasticities for alcohol and tobacco were, in general, high which indicates that these items are relative luxuries. Thus an increase in income will cause a significant increase in alcohol and tobacco expenditures. From the point of view of economic theory, if consumption increases, then the level of living increases. However, from a medical viewpoint, excessive consumption of alcohol and tobacco is considered harmful. Thus, the recreation and entertainment component and the satisfaction dimension may be deemed to have increased. But, since the health component will have decreased, the net effect on the level of living cannot be ascertained.

The aggregate consumption elasticities for education

and reading materials ranged from 0.78 for small farm households to 2.01 for medium farm households. An increase in income thus causes an increase in education and reading expenditures which denotes an increase in the level of living.

The health component considers the actual health situation of the members of the household. Expenditure of income on medical services can be considered in three categories:

- 1) medical insurance premiums;
- 2) voluntary check-ups with doctors, dentists, or optometrists for preventative care; and
- 3) forced expenditures (especially for drugs) due to illness.

Expenditure on medical insurance premiums can be considered as a positive contribution to the level of living if the value of services used in a given year is equal to or greater than the insurance premium. Even if the full value of the premium is not consumed in terms of health services, medical insurance is a positive contribution to the level of living to the extent that some degree of security is provided and the need to save for unexpected medical expenditures is removed. Expenditure on voluntary check-ups can be considered as a positive contribution to the extent that the actual health situation of the household members is increased or prevented from potential decline. Medical

expenditures that are forced due to illness cannot signify an increase in the health component of the level of living. If there is an illness, this denotes that the actual health situation has decreased.

For the small farm group, medical expenditure exhibited the highest elasticity of all the expenditure categories. As the farm size increased (and total consumption expenditure increased), the absolute value of the elasticity of medical expenditure decreased. Also, the relative ranking of medical expenditure decreased as farm size increased. This indicated that as farm size (and total consumption expenditure) increased, medical expenditure became relatively less important. The same trend was evident between the rural non-farm and the urban groups. Total consumption expenditure was, on the average, larger for urban households while the elasticity for medical expenditure is smaller, both absolutely and relatively. This trend of decreasing elasticity for medical expenditure as total consumption increases would not be expected to exist today because the present government has significantly lowered the premiums for the provincial compulsory medical insurance scheme.

The aggregate consumption elasticity for housing ranged from 0.59 for rural non-farm households to 1.49 for small farm households. An increased expenditure on housing is considered as an increase in the quality, quantity, or

both, of housing and thus the level of living is increased. However, our data measured the quality of housing by the value of the house. Yet quality of housing was not the prime determinant of the price of a house in the Interlake. The location of a house in relation to major population centers was a more fundamental determinant of the price of a house. Thus, an increase in the cost of housing, where cost of housing includes a cost which is an imputed percentage of the value of the house, cannot necessarily be considered as an increase in the level of living.

The aggregate consumption elasticity for household equipment ranged from 1.22 for large farm households to 2.38 for urban households. This category contained the purchase of consumer durables such as household equipment and furnishings. This range in elasticities indicates a greater tendency to purchase consumer durables at higher levels of income. An increase in the ownership of consumer durables provides an increase in the level of living.

There was a marked difference in the aggregate consumption elasticities for recreation and entertainment between the farm groups and the non-farm groups. This may indicate a difference in societal valuation of recreation expenditures, but it may be a more significant indicator of the availability for the non-farm groups of recreation and entertainment facilities that require dollar expenditures.

The consumption category denoted as "other services

and supplies" is a residual category. However, an increase in expenditure on any of the items included in this category would represent an increase in the level of living.

In summary, an increase in total consumption will cause an increase in all consumption categories, except home produce. However, an increase in some consumption categories (specifically, food, clothing, transportation, alcohol, tobacco, health services, and housing) does not necessarily represent an increase in the level of living.

CHAPTER VIII

LIMITATIONS AND IMPLICATIONS

In general, the limitations involve the data and technical aspects of estimation of the economic relationships.

The data were not representative of the entire Interlake Area because Indian reservations, colonies (such as Hutterite colonies), and institutions (such as religious institutions or homes for the aged) were not sampled.

The questionnaire was not designed for the enumeration of farms that were partnerships or corporations. There were 12 such farms in the original set of data. The returns to labour and management and the return to equity investment could not be ascertained for the household from which the consumption pattern was obtained. Furthermore, it was not apparent in which farm size classification the household belonged. Thus these 12 farm questionnaires were not included in this study.

The relation of so-called free goods (primarily air and water) to the level of living was not explicitly considered. However, the availability of clean air and water was not generally a problem in the Interlake Area in 1968. Also an income increase would have little impact on air or water pollution if these items became significant in a discussion of the level of living.

This study tended to dwell on observable components of the level of living. However, the consideration of more subjective valuations must not be discounted. The generally-accepted cultural disadvantages and the environmental advantages of rural living in comparison to urban living were discussed in Rural People in the American Economy.¹ The danger of using observable indicators of the level of living was underlined by Abell who found that a farm operator's interpretation of his level of living often differed from an objectively determined level.²

A fundamental assumption of the analysis of consumption expenditure was that relationships estimated from cross-section data are applicable in time-series discussions. However further study is needed to determine the validity of estimating time-series behaviour from cross-section data.

The reliability of the results was measured in terms of R^2 and the "t" values. The statistical validity of the results should, however, be further examined, including an analysis of the correlation of residuals and autocorrelation. Multicollinearity was not a problem.

¹Economic Development Division, United States Department of Agriculture, Rural People in the American Economy (Washington: United States Department of Agriculture, Agricultural Economic Report No. 101, 1966), especially pp. 37-40.

²Helen C. Abell, Alberta Farm Operators and the Level of Living Concept (Ottawa: Canada Department of Agriculture, Report No. 2, 1952), p. 16.

The correlation coefficient between consumption (C) and family size (N) was not greater than 0.71 for any urbanization class. Similarly, the highest correlation coefficient for income (Y) and family size (N) was 0.50.

The results of the consumption analysis cannot be extrapolated directly to Manitoba, or Canada in general, without taking due account of the demographic characteristics particular to the Interlake Area.

This study estimated Engel functions separately for each commodity group. However it was noted (page 38, footnote 20) that the expenditure on each commodity group is not independent. Thus, an improvement would entail the development of a complete model to estimate functions consistent with the overall budget allocation process of the consumer.

The summing of total earned income, total transfer income, and annuitized net worth prevented the determination of the net impact of different types of income on consumption. They were summed because of the problem mentioned earlier (page 60) where total earned income decreased as farm size increased due to the subtraction of an imputed return to capital. Further study is required to determine the effect of different types of income on consumption.

Also, for the calculation of net farm income, a fixed depreciation rate was used. Thus the calculated net farm income may not in fact represent the disposable income

viewed by the farmer as being available for household consumption expenditure. There is need for further study in this area.

The discussion presented in this study has implications for public policies which propose to increase the level of living with income transfers. In general, it was found that income has a direct effect on a few components, a partial but direct effect on other components, and a negligible effect on some other components of the level of living. (In fact, there are cases where there is a negative impact on the level of living due to an income increase.) This suggests that policies attempting to alleviate low levels of living (or poverty) must determine which components of the level of living need to be increased and then determine whether an increase in income will increase these specific components. Furthermore, it must be determined whether the income increase will cause the required effect on the given component because income can only directly alter that aspect of each component which can be purchased in the marketplace.

The results of the consumption function and Engel curve analysis have specific implications for an income supplement program. For example, the marginal propensity to consume for farm households was about one-half of the marginal propensity to consume for non-farm households. This implies that an income supplement with the purpose of

providing a given level of household consumption would need to be about twice as large for farm households.

Furthermore, the Engel curve analysis showed different elasticities and, in fact, a different ranking of elasticities between farm and non-farm households. This implies different consumption behaviour patterns which must be considered in the application of an income supplement program.

The estimated consumption functions and Engel curves have a direct application to the specification of minimum economic levels of living or poverty lines. Orshansky (see page 15) adopted a minimum nutritional food budget, observed that poor people spend one-third of their income on food, and multiplied the minimum nutritional food budget by three to set a poverty line. However she did not consider the consumer preferences of the poor people. That is, she (and Podoluk, apparently) did not ascertain whether poor people (as she defined them) would buy the minimum nutritional food budget. In order to ensure that the minimum nutritional level is attained, studies should determine at what level of food expenditure families actually attain a satisfactory nutritional food intake. Then functions as specified in this study can be used to determine an operational poverty line. The functions of this study allow the poverty line to be adjusted for degree of urbanization and family size.

In the analagous case of minimum housing requirements, let us assume that a study of housing expenditures has determined that an annual housing expenditure of \$1000 (\$83.33 per month) will provide the minimum level of housing for urban Interlake households. The functions presented in this study can then determine the guaranteed level of income necessary to ensure the minimum level of housing consumption. Knowing this minimum level of income, the total cost of an income supplement program can be obtained. That is, if there is a policy to improve the level of housing, this study shows the cost of one alternative program (a supplement to household income) which can achieve this end. The calculations required to determine the cost of such a program are illustrated below.

First, the Engel curve shows the level of total consumption expenditure associated with a housing expenditure of \$1000. The consumption function then shows the level of income associated with this level of total consumption.

From the estimated Engel function for urban households,

$$\begin{aligned} \log (\text{cost of housing}) = & -0.4267 + 0.9243 \log C \\ & + 0.04063 \log N \end{aligned}$$

and using the average value of N (the average urban family size being 43.14 "person equivalents"), a total consumption expenditure (C) of \$4320 is required to predict a level of housing expenditure of \$1000. The consumption function then

shows the level of income that is associated with a total consumption expenditure of \$4320.

From the estimated consumption function,

$$C = 843.31 + 0.4012Y + 28.55N$$

and using the average value of N (43.14 "person equivalents"), the necessary level of income is \$5595.81.

Thus, in order to raise the annual consumption of housing of urban Interlake households to \$1000, household income must be raised to \$5595.81.

The total cost of a program which supplements household income can now be determined. The calculation is explained in a footnote.³ The annual total cost for urban

³The distribution of income in the sample of Interlake urban households was:

Category	Income Group	Number in Group	Average Income
i	0 - \$ 2000	14	\$ 1603
ii	2001 - 4000	41	3057
iii	4001 - 6000	40	5082
iv	6001 - 8000	42	6964
v	8001 - 10000	35	8911
vi	10001 - 12000	23	10860
vii	12001 - 14000	11	12969
viii	over 14000	12	18710

The first step in the calculation was to determine the average supplement to households in each income group. This was accomplished by subtracting the average income in each income group (\$1603 for group i) from the specified minimum income (\$5596) as follows:

i	\$5596 - \$1603 = \$3993
ii	5596 - 3057 = 2539
iii	5596 - 5082 = 514

This illustrative example assumed that an equal percentage of samples was obtained from each municipality. That is,

Interlake households is \$4.4 million. This cost must then be compared with alternative programs (for example, public housing projects) for raising the level of housing.

this calculation was not weighted by the sampling ratio of each municipality. Table V-A, page 49 showed the total population of Interlake urban households to be 5325. The number of urban households in the Interlake Area in each income group was then calculated. This was obtained by multiplying the fraction of the sample (218 for urban) in each income group (14/218 for group i) times the total population of urban households (5325) as follows:

i	$14/218 \times 5325 =$	342
ii	$41/218 \times 5325 =$	1002
iii	$40/218 \times 5325 =$	977

The total income supplement for urban Interlake households is then the sum of the total income supplement in each income group:

i	$\$3993 \times 342$ households =	\$1,365,486
ii	2539×1002 households =	2,543,138
iii	514×977 households =	<u>502,250</u>
		4,410,874

Thus, the total income supplement to increase the level of housing consumption to \$1000 per year for urban Interlake households is \$4.4 million.

CHAPTER IX

CONCLUSIONS

This study shows that previous discussions of the level of living and the specification of poverty lines suffer from three major defects:

- 1) income does not have a direct impact on all components of the level of living because many components have non-purchasable dimensions;

- 2) a measured increase in consumption expenditure does not necessarily indicate an increase in the level of living; and

- 3) the present method of specifying poverty lines does not consider the actual consumer preference patterns of the poor. For example, Orshansky (see pages 15 and 97) did not determine whether families at her specified poverty line would in fact purchase an adequate nutritional level of food.

These defects can be overcome by an explicit consideration of the relationship of income to the level of living and a full consideration of income-expenditure patterns in the specification of poverty lines as described in this study.

Specifically, it was found that an income increase has a direct and positive impact on a few components, a positive but only a partial impact on other components, and

a negligible impact on still other components of the level of living. In two cases, an income increase has a negative impact on the level of living.

A direct and positive impact due to an income increase exists in the case of components which can almost totally be purchased in the marketplace. These components are food and clothing.

A positive but partial and often indirect impact exists in the case of some other components. These components, which have aspects that cannot be purchased in the marketplace, include health, education, transportation, and recreation and entertainment.

A negligible impact exists on another set of components. The components affected thus are human freedoms, conditions of work, employment situation, basic services, and political position, all of which have no purchasable aspects.

If the increase in income is stigmatized, the status and satisfaction component is decreased which yields a negative impact on the level of living. If the increase in income causes an undesired increase in leisure-time (that is, a decrease in working-time), there is a negative impact on the level of living.

As farm size increases (and therefore, as income becomes more variable), the ability of current income to predict household consumption expenditure decreases. The

marginal propensity to consume, which was greater than zero but less than one, was markedly lower for the farm groups. This suggests that there is a difference in consumption behaviour between farm and non-farm households.

Family size was found to be an important determinant of household consumption expenditure.

In general, the elasticity for any consumption category was not constant across all urbanization groups. Furthermore, the ranking of elasticities was different between the non-farm groups and the farm groups, and the ranking was different between farm groups of different sizes. Therefore there are differences in household consumption behaviour between farm and non-farm households and between households of different sized farms.

Total expenditure elasticities of Interlake households were compared with those of Houthakker for urban Canadian households in 1947 and with the 1926-1966 time-series estimates of Schweitzer for Canada. The results for urban Interlake households compared favourably with the results of Houthakker and did not differ markedly with the results of Schweitzer. However, the absence of studies which undertook an analysis of the differences in farm and non-farm household expenditure patterns, prevented further comparisons.

Home-produced goods were generally found to be an inferior item. Transportation becomes a relative necessity

as farm size increases, but it is a relative luxury for rural non-farm and urban households. Food and clothing are necessities. Recreation and entertainment, alcohol, and tobacco generally are relative luxuries.

A measured increase in consumption expenditures is an inadequate indicator of an increase in the level of living. This is because a measured increase in expenditure in the categories of food, clothing, transportation, alcohol, tobacco, and health services may in fact represent a decrease in the level of living.

The failure of present methods of specifying poverty lines to consider the actual consumption preference patterns of the poor was described. An improved method of poverty line specification was suggested.

In conclusion then, in terms of the objectives specified on page five, the impact of an increase in income on each component of the level of living has been considered, the change in household consumption expenditures by category for the Interlake Area has been determined, and the inadequacies of indicating a change in the level of living by a change in consumption expenditures has been discussed.

APPENDIX

SAMPLES AS PERCENT OF POPULATION OF MUNICIPALITY

Municipality	Small Farm			Medium Farm		
	Sample ^a	Popula- tion ^b	% ^c	Sample	Popula- tion	%
Armstrong	13	410	3.17	39	257	15.18
Bifrost	3	255	1.18	23	235	9.79
Coldwell	7	132	5.30	9	62	14.52
Eriksdale	5	73	6.85	7	53	13.21
Fisher	12	399	3.01	32	364	8.79
Gimli	9	107	8.41	7	96	7.29
Grahamdale	13	169	7.69	29	183	15.85
Rockwood	11	123	8.94	30	371	8.09
Rosser	4	68	5.88	9	105	8.57
St. Andrews	11	758	1.45	20	201	1.45
St. Laurent	1	21	4.76	6	33	18.18
Siglunes	1	50	2.00	15	101	14.85
Woodlands	6	177	3.39	8	182	4.40
TOTAL	96	2742	3.50	234	2243	10.43

^aSample denotes number of sample observations (households).

^bPopulation denotes population size in 1968 (households).

^cSample as percent of population.

APPENDIX (continued)

Large Farm			
Municipality	Sample	Population	%
Armstrong	20	136	14.71
Bifrost	1	13	7.69
Coldwell	14	91	15.38
Eriksdale	9	61	14.75
Fisher	24	140	17.14
Gimli	1	6	16.67
Grahamdale	18	129	13.95
Rockwood	7	67	10.45
Rosser	4	36	11.11
St. Andrews	3	38	7.89
St. Laurent	3	39	7.69
Siglunes	15	95	15.79
Woodlands	7	81	8.64
TOTAL	126	932	13.52

APPENDIX (continued)

Municipality	Rural Non-farm			Urban		
	Sample	Popula- tion	%	Sample	Popula- tion	%
Armstrong	31	429	7.23	-	-	-
Bifrost	9	172	5.23	41	360	11.39
Coldwell	10	143	6.99	13	223	5.83
Eriksdale	4	55	7.27	7	99	7.07
Fisher	25	313	7.99	14	194	7.22
Gimli	5	174	2.07	30	491	6.11
Grahamdale	25	554	4.51	-	-	-
Rockwood	11	183	6.01	41	953	4.30
Rosser	12	101	11.88	-	-	-
St. Andrews	16	817	1.96	49	2711	1.81
St. Laurent	9	204	4.41	10	107	9.35
Siglunes	7	119	5.88	13	187	6.95
Woodlands	16	226	7.08	-	-	-
TOTAL	180	3490	5.16	218	5325	4.09

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