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TITLE OF THESIS/TITRE DE LA THÈSE SPATIAL VARIATIONS OF SOCIAL WELL-BEING IN ONTARIO

UNIVERSITY/UNIVERSITÉ CARLETON UNIVERSITY

DEGREE FOR WHICH THESIS WAS PRESENTED/
GRADE POUR LEQUEL CETTE THÈSE FUT PRÉSENTÉE MASTERS

YEAR THIS DEGREE CONFERRED/ANNÉE D'OBTENTION DE CE DEGRÉ 1980

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SPATIAL VARIATIONS OF SOCIAL WELL-BEING
IN ONTARIO

by

C

SAMUEL STEPHEN ARYEETEEY-ATTOH

A Thesis submitted to the Faculty of
Graduate Studies in Partial Fulfillment
of the Requirements for the Degree of
Master of Arts

Department of Geography
Carleton University
Ottawa, Canada

April, 1980

The undersigned recommend to the Faculty of
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SPATIAL VARIATIONS OF SOCIAL WELL-
BEING IN ONTARIO"

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ABSTRACT

In recent years there has been growing interest in geography in defining and using social indicators to explore previously neglected aspects of regional or territorial disparities. This study is offered as a contribution to this growing body of geographical literature. The study attempts to determine, describe and analyse spatial variations in social well-being using Ontario as a case study. The concept of social well-being is operationally defined and it is measured by a set of 68 territorial indicators. Seven major dimensions and a comprehensive index of social well-being are established and analysed through the use of a principal components analysis. This is complemented by the mapping of component scores to reveal local variations in each of the dimensions of social well-being. For the most part the geography of social well-being in Ontario is similar to the spatial distributions of urbanization, industrial development, and agricultural activity.

ACKNOWLEDGEMENTS

This thesis is dedicated to my parents for their long-standing support and interest. I am grateful to my sisters: Celia, Sylvia, Patricia, Susan and Tina for their encouragement. Likewise I am grateful to my brother for his support. Special mention must be made of Antoinette who has been of great inspiration to me.

Very special acknowledgement is due to Professor David Bennett, my supervisor. I am greatly indebted to him for the variety of suggestions he offered and for his advice, direction, encouragement and generosity. I am also very grateful to Mrs. Marilyn Bennett for assisting a great deal with the computer work. April McIlhagga also deserves special mention; I am deeply grateful to her for accepting the task of typing my thesis and for doing an excellent job. My thanks go to Christine Earl for drawing the base map of Ontario, and to Peter Souchen for making available data on air pollutant emissions.

Finally, I wish to express my gratitude to the Harkness family for their wonderful hospitality and for making my stay in Ottawa a pleasant one.

Samuel S. Aryeetey-Attoh

April, 1980

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CHAPTER 1

INTRODUCTION AND OVERVIEW

This study is a response to Smith's (1973: 14) call for a more humane human geography - a human geography which is relevant to the needs of society, which focuses directly on the types of problems faced by people in their everyday lives and which directs its attention to actual human problems.

Geography appears to have been so tightly locked into traditional ways of structuring knowledge, so deeply committed to existing paradigms, and recently, so preoccupied with techniques and methodology that it has tended to overlook the growing disparity between its subject matter and the changing concerns of society at large. What is now emerging is a new approach - a more 'socially' responsible geography which represents a rethinking of geography against new criteria of relevance and which represents a shift of interest from the exploitation of resources and production of goods and services to the protection of the environment, and to contemporary social problems. Smith regards this shift of emphasis and interest as the second major revolution in human geography - the radical/relevance revolution. He states that:

"The quantitative revolution had never been accepted by a substantial old guard on both sides of the Atlantic, but at the end of the 1960's, the younger generation of American geographers also began to express disquiet. Concern at the impersonal, mechanical approaches of the new geography was in fact part of a more general feeling that the discipline was

failing to respond to major contemporary social issues. Particular targets were pollution, poverty, hunger... social inequality or injustice." (Smith, 1977; 4).

As can be seen, this revolution of relevance which began in the United States of America has social responsibility as its main priority. Although Dickenson and Clarke (1972) are quite skeptical about the revolution being readily acceptable in British Geography, a number of studies relating to social issues and problems have already been conducted in Britain; Knox (1975) for example examines levels of living whilst Robson (1979) examines housing issues; and a book edited by Smith and Herbert (1979) which deals with a number of social issues - health, housing, ethnicity, crime, human health problems - within the context of the British city. Actually, from the beginning of the 1970's, the literature on social problems and issues has expanded rapidly. Poverty formed the subject matter of two issues of *Antipode* (Peet, 1970; 1972). Texts on the black ghetto (Rose, 1971); the geography of crime (Harris, 1974), and health care (Shannon and Denver, 1974) followed. Smith (1977) has argued persuasively for a geography of social well-being and outlined a welfare approach which could provide a useful focus for human geography. As a result, the theme of social well-being is not new to geography. This study is therefore offered as a contribution to the growing body of literature on contemporary social conditions, with particular respect here to the province of Ontario.

The major purpose of this study is to portray spatial variations or disparities in social well-being between fifty-four census divisions of Ontario, using sixty-eight territorial indicators of social well-being (refer Map 1 and Table 3.2). The variables used are referred to as

MAP 1:9 Base Map of Ontario Showing Boundaries of Census Divisions

TABLE 1.1

LIST OF CENSUS DIVISIONS FOR THE
PROVINCE OF ONTARIO

1. Algoma	19. Kenora	37. Perth
2. Brent	20. Kent	38. Peterborough
3. Bruce	21. Lambton	39. Prescott
4. Cochrane	22. Lanark	40. Prince Edward
5. Dufferin	23. Leeds	41. Rainy River
6. Dundas	24. Lennox & Addington	42. Renfrew
7. Durham	25. Manitoulin	43. Russell
8. Elgin	26. Middlesex	44. Simcoe
9. Essex	27. Muskoka	45. Stormont
10. Frontenac	28. Niagara	46. Sudbury
11. Glengarry	29. Nipissing	47. Thunder Bay
12. Grenville	30. Norfolk	48. Timiskaming
13. Grey	31. Northumberland	49. Toronto
14. Haldimand	32. Ontario	50. Victoria
15. Haliburton	33. Ottawa-Carleton	51. Waterloo
16. Halton	34. Oxford	52. Wellington
17. Hastings	35. Parry Sound	53. Wentworth
18. Huron	36. Peel	54. York

territorial indicators of social well-being on the basis of Cant's (1975) definition of territorial social indicators (see page number 24). Criteria on Housing, Health, Education, Income and Wealth, Employment, Social Disorder, Service Availability, Population, Ethnicity, Welfare and Social Security, Democratic Participation and Environmental Quality are used in the study to reveal the underlying spatial patterns that exist in the social geography of Ontario.

It has been argued (Smith 1977; 271) that the single variable of monetary income is not a satisfactory surrogate for the general condition of social well-being. Therefore another task of this study is to generate composite indices or territorial indicators of social well-being from the original set of sixty-eight variables, by using a Principal Components Analysis. Moreover, identifying broad spatial variations in social well-being requires the derivation of a single general indicator or a restricted set of indicators measuring dimensions of the concept.

The study is largely descriptive in nature, despite the fact that some attempt is made at explanation. In other words, no rigid explanation is given as to why certain disparities in well-being exist between the spatial units. The aim is mainly to describe certain social conditions and how they vary from one unit to another. It must also be pointed out that the study is largely exploratory in nature, and is by no means intended as a definitive statement of territorial well-being, since no adequate social theory has been developed yet that gives a specific definition of social well-being, and that offers unequivocal guidance in the selection of variables, as is discussed later.

The geographical significance of the study is that social conditions and well-being levels vary from place to place in some meaningful pattern, and this allows for comparisons between territorial units to be made. The identification of areal variations in social well-being would appear to fall within the field of geography by almost any definition of the discipline. Areal variations in social well-being comprise a vital dimension of the social state of any nation, region or province for that matter - something which other social scientists not endowed with the geographer's spatial perspective can overlook as they develop indicators for large population aggregates in which distinctive local characteristics are lost. The early recruits in the social indicators movement who were predominantly economists, political scientists, psychologists and sociologists, laid emphasis very much on national-aggregate conditions. With geographers now in the picture, a spatial perspective has emerged, prompted by the recognition of an important geographical dimension to national social performance, and with the result that there is more stress on the territorial disaggregation of national or regional/provincial populations.

Ontario is an ideal area for the study. It is the most populous and most prosperous province in Canada. It contains one-third of the nation's population, which produces more than one-half of Canada's manufactured goods, one-quarter of her output from mines and forests, and one-third of the farm income (Gentilcore: 1972). It has quite a large number of spatial units (census divisions) which are useful for the analysis and comparative purposes of the study. Moreover, the important question of data availability is resolved, more or less, in terms of accessibility and proximity of data.

Briefly, the task of this study is to establish an operational definition of social well-being, to compile data necessary to determine spatial disparities and variations and to set down these observations in numerical and cartographic form. As a result chapter two of the study forms a sort of background to the study, with a discussion on the social indicators movement which is aligned to the concerns of this study. Major problems and issues of the movement are discussed, some of the problems are in fact encountered in this study. The concept of territorial social indicators which is an important aspect of this study is also discussed. Chapter three dwells on the more important tasks of this study. An operational definition of social well-being is attempted, followed by a review of the variables selected for the study, and then the major problems associated with the data. The sources of data are also given and finally a look is taken at the method of analysis adopted for the study. Chapter four highlights the results and observations of the study. The major dimensions or components of social well-being are interpreted and the scores for each spatial unit on each component are presented in cartographic form to reveal spatial variations. Some comparisons are then made between the observations of this study and other related studies. By way of conclusion, chapter five provides a summary on the relevant aspects of the findings of this study, as well as some major limitations of the study.

CHAPTER 2

LITERATURE REVIEW

2.1 THE SOCIAL INDICATORS MOVEMENT

Since this study is mainly concerned with illustrating geographical variations in social well-being in Ontario, it represents an attempt to align geography and the social indicators movement. Therefore it is worth touching on the major aspects of the movement.

2.1.1 Background of the Movement

Sometime in the 1920's, the idea began to take shape that a society should be able to produce a quantitative picture of itself and its changes. A Presidential Committee in the United States, appointed in 1929, set about the task and produced a massive report entitled 'Recent Social Trends' (1933). Although not maintained thereafter the work and the concept behind it are forerunners of the present social indicators movement.

The contemporary social indicators movement began in the United States in the middle 1960's. It took the form of a call for better data with which to measure the social state of the nation, arguing that there should be a system of social indicators and an annual social report to complement the existing series of economic indicators and the President's Annual Economic Report. It reflected something of the changing society in which it was spawned, with its growing realisation that the 'Quality of Life' is not necessarily a direct reflection of Gross National Product,

Per Capita Income and the "advance of technology" towards some unspecified objective. Another initial justification for social indicators was the need to have a clear break from economic indicators - a need to break away from 'economic philistinism', to use Gross's (1966) term, and the need to break away from notions, such as, that economic growth is always inevitable and good.

DeNeufville (1975), points out that the recent interest in social indicators was triggered by the rethinking of priorities in American society in the late 1950's and early 1960's. Earlier Russian successes in space had led to a massive U.S. space program and concentration on scientific research and education. NASA commissioned a study of the impact of the space program on society which resulted in a book which popularized the term "social indicators" (Bauer, 1966). Bauer brought together several prominent social scientists whose work came to be focused on broader questions of social measurements and their use in assessing the state of society relative to national goals. Other publications that appeared around the same time were: a short volume by Gross (1966) for the London-based Tavistock Institute, the results of a Russell Sage Foundation Project edited by Sheldon and Moore (1968), and a reprint of two special issues of the Annals of the American Academy of Political and Social Science. According to Smith (1973; 33) this first thrust of the movement culminated in the publication by the U.S. Department of Health, Education and Welfare, of 'Toward a Social Report' in the last days of the Johnson Administration. This represented the first attempt to produce a social equivalent of the Annual Economic Report, and provided a broad if relatively brief review of the state of the nation on a wide range of social conditions.

The movement in the United States has had its parallel in Great Britain and Canada. Government interest in Great Britain was expressed by the publication of a new annual statistical report, 'Social Trends', compiled by the Central Statistical Office. The Prime Minister of Canada, Pierre Elliott Trudeau, also suggested a move from a predominant emphasis on GNP towards an emphasis on net human benefit (Stewart, 1972: 23). Canada's central statistical agency (Statistics Canada) became aware of the need for a more systematic and more explicitly integrated development of social statistics. However, although the contemporary social indicator movement began in the U.S. around the mid 1960's, research leading towards greater integration as well as towards an increased tempo of development of social statistics, together with the initiation and development of work relating to social indicators only began late in 1970 in Canada (Hans Adler, 1972; 135). This resulted in the publication of a new annual compendium on social statistics in 1974 - 'Perspective Canada'. The publication was partly a response to growing public concern about the quality of life in Canada and partly was a Statistics Canada project to show what could be done by way of providing information. A major objective of the publication was to help Canadians to make their own judgements about 'Quality of Life', and to provide insights into present conditions and possible changes, as well as to help Canadians to make their own assessments of how Canada has been managing to deal with social problems (Perspective Canada; 1974, xxi).

Within Ontario, a two-volume publication, 'Ontario Statistics', was published in 1975. The publication represents the latest step in an

evolutionary process that began in 1964 with the first issue of the Ontario Statistical Review. The Ontario Statistical Centre felt that the Review's users might benefit by having the contents expanded to include not only economic data, but also social statistics. The idea was put to the test in 1974 by means of a questionnaire sent to the Review's 'subscribers'. The response was positive and the result was the creation of the new publication containing both economic and social data related to Ontario and its regions.

Despite increasing government attention to social issues, there are many technical, conceptual and methodological difficulties yet to be resolved in the area of social indicators. As in any movement still in its infancy, there is much uncertainty as to just how the job should be done. A number of these difficulties and problems facing the movement are examined below.

2.1.2 Definition of Social Indicators

There is a considerable debate as to what really constitutes a social indicator. Land (1970: 322) emphasizes that the extravagant claims made for social indicators are partly due to the diverse intellectual origins of those concerned with social indicators and this has led in turn to diverse conceptions of social indicators and their uses. An examination of some definitions of social indicators might help to clarify this issue.

The U.S. Department of Health, Education and Welfare (1969: 97) defined the term as follows:

"A social indicator as the term is used here, may be defined to be a statistic of direct normative interest which facilitates concise, comprehensive and balanced judgements about the condition of major aspects of a society. It is in all cases a direct measure of welfare and is subject to the interpretation that, if it changes in the right direction while other things remain equal, things have gotten better, or people are "better off". Thus statistics on the number of doctors or policemen could not be social indicators, whereas figures on health or crime rates could be." (Emphasis added.)

Sheldon and Freeman (1970), have noted some flaws in this definition.

Firstly the position that indicators must be of 'normative interest' is too restrictive because what is relevant today may not be relevant next year. Secondly, the requirement that indicators need to be measures of welfare is too confining in that it rules out many variables that may be relevant to an understanding of the indicator. For instance, statistics on the number of doctors and teachers (as employed in this study) would be significant for an understanding of health and education respectively although not directly a measure of achieved health or learning. In short, the definition of social indicators given in 'Toward a Social Report' excludes many variables from consideration that are relevant to an evaluation of the condition of major aspects of a society. On the other hand, Sheldon and Freeman point out that social indicators are time-series that allow comparisons over an extended period which permit one to grasp long-term trends as well as unusually sharp fluctuations in rates. Another aspect of social indicators which they point out, and which is of some relevance to this study, is that social indicators are statistics that can be disaggregated by relevant attributes of either persons or the conditions measured (such as skin colour or year of construction of dwellings)

and by the contextual characteristics that surround the measure (such as region, city size or census divisions as in this study).

Sawhill (1969) describes social indicators as quantitative measures of social conditions designed to guide choices at several levels of decision-making. Olson (1969; 339) says that, "a social indicator must be part of a coherent system of socio-economic measurement that can facilitate comprehensive and balanced judgements about the condition of major aspects of a society." Smith, D.M. (1975; 364) broadly defines a social indicator as any measure of a major dimension of societal well-being or performance. Rao (1975: 123), provides a generalized but useful definition of social indicators. He states that:

"Social indicators are generally derived summary series designed to portray the state and trends in social conditions that are, or are likely to become, the subject of public action or concern. They should yield information on the extent to which existing conditions correspond to generally accepted social goals and the pace at which these objectives are being rendered."

He further states that they should therefore focus on: (i) the main facets of the well-being of the population (as is the case in this study), (ii) the performance, that is effectiveness and efficiency of the social services, and (iii) the distribution of well-being, and the use of benefits from the social services, over the population. They should be useful in depicting the state of social affairs and detecting social conditions which need correction, in setting targets for this purpose and in ascertaining the general achievements of social programmes and policies. Rao also refers to another useful definition from a document on social statistics entitled: 'Towards a System of Social and Demographic Statistics'. Without attempting

a precise definition of the term, the report describes social indicators as:

"Constructs, based on observations and usually quantitative, which tell us something about an aspect of social life in which we are interested or about changes that are taking place in it. Such information may be objective in the sense that it purports to show what the position is or how it is changing; or it may be subjective in the sense that it purports to show how the objective position or changes in it are regarded by the community in general or by different constituent groups."

Summing up the criteria for defining social indicators, the report adds:

"Social indicators relate to some area of social concern and they may serve the purposes of curiosity, understanding or action. They may take the form of simple data series or they may be synthetic series obtained by applying a greater or lesser amount of processing to data series. At any particular time, it may not be possible to construct all the indicators that would be desirable and this limitation should be kept in mind. Social indicators form a subset of the data series and constructs actually or potentially available and are thus distinguished from other statistics only by their suitability and relevance for one of the purposes mentioned." ('Toward a System of Social and Demographic Studies', United Nations document ST/STAT.68, dated 24 July 1973, prepared by Professor Richard Stone.)

There are several other definitions of social indicators presented by scholars from diverse fields; however, Walters (1972; 7), provides a summary list of "many specific, if not optimistic rationales for social indicators". These are to:

- put issues in a form suitable for popular discussion, and to broaden the basis for such discussion;
- present a more balanced view by placing more social issues and options on the table;
- make visible those conditions which the alienated and unheard minorities cannot make explicit;
- increase the visibility of the data, and thereby of the problem, both in the government and in the private sector;
- shift emphasis from the economic, and frequently more quantifiable aspects;

- make public and private postures and decisions more explicit and informed;
- aid in the establishment of goals and objectives, and in the selection of priorities among them;
- assess progress towards goals or objectives;
- provide data for models, for policy and program formulation and evaluation;
- identify emerging problems sooner;
- monitor the effects of policies and programs; and even
- generate real output measures which are needed for a Programme, Planning, Budget System.

Sheldon and Moore (1970), again provide a critique on three of the rationales listed above: the setting of goals and priorities, the evaluation of programs, and the development of a balance sheet. With regard to the setting of goals and priorities, they remark that although it is foolish to argue against the use of indicators in planning and development or to expect them to disappear as a means of influencing politicians and their electorates, it is naive to hold that social indicators in themselves permit decisions on which programs are to be implemented, and it is especially naive to hold that they allow the setting of priorities. Their viewpoint is that priorities and goals are more dependent on national objectives and values than on assembled data. Furthermore, with respect to the evaluation of specific programs, they argue that this use of indicators would require one to be able to demonstrate statistically that programs determine the outcomes measured by the indicators rather than other factors 'causing' the results. They point out that there have only been a handful of respectable evaluation studies on social programs. With respect to the development of a balance sheet, they point out that it not only

requires a set of categories - ones conceptually based and integrated - but some common interval measure such as money. They further point out that neither the state of conceptualization nor technique in the social sciences other than economics has produced necessary measures.

Various viewpoints and definitions relating to social indicators have been examined and it can be seen that there is much debate and criticism. Again, the views presented are so diverse that it is difficult to arrive at a generally acceptable definition of social indicators. There are also problems connected with social reporting and social accounting, the macro-frameworks of social indicators. These are examined below.

2.1.3 Social Reporting and Social Accounting

The idea of an annual social report and a national system of social accounts was initially suggested by Gross (1966) who argued that professional economists, using only economic analyses, had excluded other relevant social science expertise in the formation of national policy. However, Gross never specifically proposed what sort of statistical data should be included in a system of social accounts and what substantive areas should be covered in a social report, but he had put a provocative idea into the public domain. Aside from Gross, there have been other calls for the development of social reports and accounts (Land, 1970; Olson, 1969; Terleckyj, 1970; Brusegard, 1978). However, there exists no fully developed system of social indicators, social accounts or social reports. Only a variety of suggestions concerning what ground they should cover and what their conceptual underpinnings should be, and what could be included in them have been put forward. In such a situation it may be useful to

indicate what has been envisaged for social reporting and accounting, as well as some of the conceptual approaches that have been suggested, to provide a framework for the substance of social reports and accounts.

Springer (1970) presents a set of functions that social accounts and reports should eventually perform. First of all, he states that they are to provide a comprehensive and, in large part, a quantitative statement about the character of a society. The problem here is that there exist no "social" models that, like economic models, identify what parameters are "relevant" or "significant". There is agreement, however, that such a statement should include what is generally referred to as sociological, as well as economic information. Secondly, social reports are expected to provide a normative assessment of this array of social accounts, how well a society is achieving a specific set of goals, and whether progress is being achieved. How such normative criteria are to be introduced is a problem. Springer also suggests that social reports should project alternative social futures which could serve as a basis of political choice. Others view social accounting as an "early warning" device that could forewarn the nation of an approaching crisis situation. More modest suggestions deal with the extrapolation of key social trends or the targeting of defined social goals. Furthermore, a social report should indicate the kinds of governmental and private actions that would ameliorate a condition, achieve a particular goal or secure a desired future.

Springer also discusses a number of approaches (the analysis of social trends and change, national goal analysis, the new political economy, futurism and systems theory) which he regards as constituting a rich and diverse

base of concepts, models, and methodologies for the development of a system of social accounts and reports. Although he does not evaluate any of these approaches intensively, he specifically refers to two efforts that attempt to suggest how to begin with the development of social reporting. Firstly, framed solidly in the tradition of the new political economy, 'Toward a Social Report', as Springer points out, is the most extensive governmental exploration of how to go about developing social indicators and accounts. The other effort was the work of Gross. He applied his variant of general systems theory to sketch out the conceptual model for the development of social accounts.

Social systems theory has been viewed as potentially capable of providing a useful framework for social accounting and reporting, in that it provides a comprehensive conceptual model capable of ordering the wide array of data that should be included in a social report. Gross (1966), outlined a comprehensive systems approach to guide the development of social indicators and accounts. He states that:

"Overemphasis upon statistics because they seem more precise, or upon economic data, because they may be more readily available, often yields a narrow or unbalanced view of the state of a nation. A broader and more meaningful view can be best obtained in my judgement through a system of national social accounting that brings together in integrated fashion the relevant concepts developed by economists, psychologists and social psychologists." (Gross 1966: 154-155.)

Gross demonstrated the need for a fine-grained application of his systems approach, in order unequivocally to demonstrate its applicability to social reporting. He argued that one can generate specific operational models that can describe any social unit, family, firm or nation. The major

elements of his general framework were seven structural variables linked to seven performance variables. His structural variables - people, non-human resources, values, subsystems, external and internal relations, and guidance, could order a vast amount of descriptive data about the structure of any social unit. From his performance variables:- satisfying interests, producing output, investing in systems, using inputs efficiently, acquiring resources, observing codes, and behaving rationally, - one could include an indefinite array of performance data and normative measures about a given social unit. Despite the intellectual effort Gross put into the development of this scheme for a system of social accounting, he concludes with the following appraisal, that:

"the ideas set forth in this chapter are little more than an initial staking out of the territory upon which vast debates must take place."

As Bauer (1966; 47) also points out, the impact of Gross's essay therefore is not to make the establishment of a national system of social accounting seem simple and within easy reach. On the other hand, he adds that, the positive features of Gross's attempt are, that he sets forth one explicit approach with subschemes of variables for the assessment of both the structure and capacity of the system and of its performance. Probably equally valuable is his critique of the problems of measurement, both in the narrower existing economic indicators and, more generally, since it makes clear that there are no easy reasons for staying within the bounds of the existing system. The key problem of a system of social indicators Gross spells out, is that one can never measure the variables that are of major interest directly, but one must select surrogates that stand in the place of such variables.

The relative success of economics in modelling a national economic system has raised the question of whether the social system might be dealt with in the same general framework. Olson (1969: 338) states that: "the existing economic indicators, particularly the national income accounts, do in fact provide a paradigm that can be used to help guide development of better social statistics. The next step is to provide a clear definition of social indicators and social accounts." The latter point of Olson's statement is certainly a difficult task in itself. Sheldon and Moore (1970: 102) remark that: evoking the economic analogy and proposing the development of social indicators that parallel economic indicators is confusing and in part fallacious. Despite its weaknesses and limited vigour, economic theory provides a definition and the specifications of an economic system and the linkages are at least hypothesized, if not empirically demonstrated, between many variables in the system. They further add that there is no special theory, even of a tentative nature, which defines the variables of a social system and the relationships between them.

One possible economic framework for a system of social indicators has been demonstrated by Terleckyj (1970). This is basically an input-output tool in which a list of activities is depicted as contributing to specific "goal output indicators" by means of coefficients similar to Leontief coefficients in conventional input-output economics. However, Hoffenberg (1970) remarks that to proceed to an input-output model involves a theory of production. And even if the equivalent in sociological theory was available, there would be the empirical problem of arriving at the coefficients to show how much social product a particular activity would input into a particular social goal output category.

There have also been some questions raised about social reports.

Brusegard (1978) examines both 'Perspective Canada' and its American counterpart 'Social Indicators, 1976'. Both reports are produced by government organizations with the intent to develop social indicators and provide a social report on the condition and progress of their respective nations. Brusegard suggests that neither goal has been accomplished or properly dealt with. He argues that to accomplish either objective in a satisfactory manner, both reports must change their organization, commentary, authorship and intended audience. Among other things, such publications must seek authors outside government, and actively draw them to the attention of education and public audiences. He further adds that social reports must address the issues of what is happening, what the likely reasons are for its happening, and what the issues mean for a group of the population five or ten years hence. He points out that there is little of this integrated approach in either report. Brusegard takes the real goals of government-sponsored documents like the two mentioned above to be separable into two components; (a) the provision of social indicators relating to the attainment of national goals, and (b) the provision of social intelligence to the public who pay for the production, in a form that relates to processes, changes and trends, and deals with reasons and consequences.

Olson (1969; 336-337) has this to say about social reports:

"One of the deficiencies of our social statistics is that they do not give us a satisfactory picture of how well or badly the nation is doing in dealing with its problems... even after priorities have been set, another deficiency in the statistics limits the effectiveness of public policy."

Olson points out that the problem does not appear to be unnecessary duplication of statistical efforts, or thoughtless decisions about what statistics should be collected, neither can the problem be ascribed to poor management. One route to the problem is the *ad hoc* character of the decisions about what statistics should be collected, and another is the fact that many of the statistics on social problems are merely a by-product of the activities of the accountant and the informational requirements of routine management.

Parke and Seidman (1978) state that the questions to be considered with respect to judging social reporting are: the adequacy of data selection, the appropriateness of the treatment of the data, the usefulness of the overall organization and the sufficiency of commentary.

From this discussion about social indicators, reports and accounts, it can be seen that the social indicators movement is beset by problems. As DeNeufville (1975; 10) notes, the development of social indicators is a far more lengthy and complex process than many who advocate new indicators recognize. Actually, one can trace the major root of these problems to the lack of social theory to help develop a system of social accounts, and to help to clarify some issues concerning the definition of social indicators. Some scholars, for instance, Stewart (1972) have gone as far as to suggest a complete moratorium on the further development of statistical social indicators until such a time as their conceptual foundations are more fully developed. However, as Carter (1972) remarks, it is unlikely that the call for a moratorium on the development of social indicators will be taken seriously, nor is there sufficient evidence that such a moratorium

is necessary. The work begun is likely to continue and spread.

This study supports Smith's (1973; 60-61) statement that the present state of knowledge should not constrain us too much, both in developing social indicators and using them in the design of public policy. The hope is that by including in a set of social indicators a range of alternative measures of the same general concept or condition, it should be possible to capture most of what really matters, even if it is not possible to define what matters precisely at present. As with the general model of society, the right set of numbers for its variables and parameters will have to emerge from research during the course of time. And the full value of such information to the policy-maker must be discovered through experience.

Many other suggestions as to the improvements of social reporting and the development of social indicators and accounts, have been offered. However, this study is not wholly intended as a commentary or debate on the different arguments and suggestions presented by scholars of the social indicators movement. It is also not intended solely as a commentary on the methods and substance of other works, rather it is offered as a contribution to the growing body of literature on contemporary social conditions, and on the variations of well-being within Ontario. As a result, it is convenient at this stage to turn to a discussion of Territorial Social Indicators which are more directly related to the objectives of this study.

2.2 TERRITORIAL SOCIAL INDICATORS

Most of the attention of the social indicators movement so far has been on the development of national measures. The focus is on the monitoring

of changes over time rather than differences between geographical territories. In other words, it is at the subnational level that the geographer makes the easiest connection with the social indicators movement. A look at 'Perspective Canada', for instance, reveals that there are hardly any data provided at the local (county or census division) level. Most of the data provided are concerned with aggregate national and provincial conditions, and this limitation is also true of the Statistics Canada census publications and the Ontario statistics publication. Stagner (1970; 61) remarks that:

"we must get away from composite figures for the entire city or state or nation, and start dealing with the realities of human beings."

Perle (1970; 4) also states that:

"What is obviously required, in addition to national social reports, is a set of systems of public social reporting produced by and geared to the specific requirements of states and localities."

Local governments at different levels often have responsibility for social programs, and the degree of concern with social problems and the commitment to helping the needy can vary considerably.

Some interest has already been shown in "urban indicators" which would facilitate comparisons between individual cities (e.g. Coughlin (1970) on goal attainment levels in metropolitan areas). There have been references to "regional indicators" (Kamrany and Christorkis, 1970), and local social reporting (Perle, 1970). A number of interesting studies have also been done, including Wilson's (1969) study of inter-state

variations of the Quality of Life in Washington, D.C.

One such study (Cant, 1975) provides a definition of territorial social indicators. A territorial social indicator is any measure applied to sets of geographical units (e.g. nations, regions or city neighbourhoods) in a manner which permits areal comparisons (Cant, 1975; 57). Smith's (1973) work in the United States, however, represents the most important contribution to the actual construction of territorial social indicators, and marks an important step in the development of a socially responsible human geography. In constructing territorial social indicators, Smith's method was to select a range of books and reports which dealt with policy issues and social problems and to analyze their content. As part of his task of establishing criteria of social well-being for the United States at the beginning of the 1970's, he selected ten American textbooks on social problems, classified their contents and produced a simple tabulation of leading problems, as follows: crime (15 chapters of text), racial problems (11), personal pathologies (9), poverty (9), family breakdown (8), urban problems (8), education (7). Using these ideas as a foundation, Smith lists seven general criteria of social well-being, (these are mentioned in Chapter 3.1). Smith's general criteria were derived largely from studies of society at a national level. But there is no reason why they should not serve at a more local level. Smith applies them to his interstate analysis, and they have influenced the selection of variables in this study.

The development of territorial social indicators can help to give focus, direction and discipline to research in the newly-emerged activist

social geography (Smith, 1972; 45). It requires the careful translation of abstract concepts into operational terms. It requires discrimination in the selection of variables, and a greater willingness than has been shown in the past to fill the gaps in the data matrix. Knox (1975) regards territorial social indicators as not merely a product of the geographer's perspective on the general social indicators movement; they are a necessary and logical extension of any realistic system of social reporting. National social indicators are aggregates of these conditions and as such may mask important problems at the local level. Furthermore, policies aimed at improving some aspect of overall national well-being often aggravate rather than improve the situation at the local level.

Despite calls by the social indicator movement for aggregate measures of social conditions, it should be realized that territorial social indicators are important in that they attempt to operate social indicators within a spatial framework; this is something which other social scientists not blessed with the geographer's spatial perspective can overlook, as they develop indicators for large population aggregates in which distinctive local characteristics are lost. It is hoped, therefore, that the indicators presented in this study can play some role in creating an awareness of the extent of spatial disparities in social well-being, and promote more active involvement in social reform.

CHAPTER 3

METHODOLOGY AND RESEARCH DESIGN

3.1 THE CONCEPT OF SOCIAL WELL-BEING: AN OPERATIONAL DEFINITION

An important consideration in this study was to develop an operational definition of social well-being, so as to fit the study within a context, as well as to help in the selection of variables. Two other concepts - Quality of Life and Level of Living - are quite synonymous with social well-being. Various definitions and criticisms of these concepts are examined here.

3.1.1 Social Well-Being

Knox (1975: 6), refers to well-being as "the satisfaction of needs and wants of the population." However, he is faced with the question of what actually is meant by needs and how should they be measured. For instance, there is the problem of attempting to define the minimum quantities and qualities that are equated with needs, for these minima will vary according to prevailing value systems and norms.

Knox offers a suggestion whereby need can be determined; that is, by consultation with experts (physicians, social workers, etc.) whose judgment and experience would be relied upon to specify the minima that define need in particular fields. Such an approach, Knox points out, may be seen by some as unjustifiably elitist. It also presupposes that scientific knowledge in each field permits specification of quantity. Another alternative would

be to analyze the factors which generate particular categories of need; for example, health problems can be related to age, life cycle and local environmental conditions. However, one drawback pointed out here is that one is rarely in a position to model such relationships adequately. A third approach relies on the premise that consumer behaviour is a direct reflection of need: goods, services and amenities whose provisions do not match market demand are assumed to reflect unfulfilled needs. This, however, tends to underestimate need in sectors where demand is inhibited by low incomes or imperfect knowledge.

None of these methods of determining need is without disadvantages. As Knox points out, the present level of sophistication in social reporting falls considerably short of measuring levels of satisfaction against specific parameters of need, however redefined. As a result, until one knows more about collective preferences and priorities, such measures must be based on those categories of need and wants that are judged by expert opinion to constitute well-being. Whilst these clearly include the consumer goods and services registered in national accounts, they also extend to a diversity of social and environmental factors as well as other factors considered in this study; such as provision of health services (population per doctor, hospital beds/1,000), housing and welfare benefits.

3.1.2 Quality of Life

Smith (1973) points out that the concept of social well-being comes close to that of "the quality of life" and to some writers they appear synonymous. If there is a significant difference it is probably because criteria of social well-being depend less on subjective judgement, on the

varying perceptions of individuals, than does the nature of the good life; this favours the use of social well-being as against quality of life. With respect to quality of life, Smith focuses on happiness, stating that it represents a still higher order of abstraction. As Rossi (1965) points out, happiness is too personal and subjective a phenomenon to be studied by the crude measuring devices presently available to the social scientist.

Smith (1977; 31) also points out that the idea of trying to measure an abstraction like the quality of life is anathema to many people, even being seen as an assault on the individual. Nevertheless, he examines various methods such as the Delphi technique which has been used to identify group value judgements with respect to what constitutes the quality of life. Two ways of determining criteria of human well-being or quality of life are also examined, the first being to derive them from theory in psychology or sociology. The problem here is that there is no generally accepted social theory setting out the precise conditions unambiguously defining human well-being along with their relative weights. The second method is to ask people how they view their own state of well-being, satisfaction or happiness; that is, attempting to discover by direct inquiry what this state is dependent on. Smith (1973; 66) further adds that:

"the use of massive surveys to find out what people themselves think about the quality of their lives and the criteria or conditions impinging on it may be the only way to avoid introducing biased values of academicians and government officials concerned with social indicators."

Smith therefore admits that any specific operational definition of social well-being ought eventually to relate to happiness or the capacity of individuals to realize their version of the good life, for this is the ultimate

criterion for determining whether society is well or sick.

Quality of life as a concept is not without critics. Brusegard (1978: 269) states that:

"By far the most disreputable and myth conjuring expression to creep into rational discussion is the innocuous but prostitutional 'quality of life'...this is the most bogus concept ever to have been embraced by seemingly intelligent men and women."

Brusegard believes that quality of life is an elusive concept which can seduce research grants, father promiscuous social surveys and breed varied reports, books and papers "all seeking recognition as the true and right-ful offspring."

Pred (1977: 10) is more modest in his criticism. He feels that the phrase has been used loosely and ambiguously to symbolize collectively both people's living conditions and the goals of urban and regional planning. He, however, provides a definition which is related to the concerns of this study:

"At the very least, the quality of life in a city or region refers to the accessibility of its inhabitants to employment alternatives, educational and medical facilities, essential public social services, a representative range of commercial and cultural services and 'nature' or extensive recreational open spaces."

3.1.3 Level of Living

Knox (1975: 31), provides a working definition of this concept in the British context. His definition also fits within the purposes and objectives of this study. He states that:

"The level of living of persons resident within a given geographical area, is constituent by the overall composition of housing, health, education, social status, employment, affluence, leisure, social security and social stability aggregately exhibited in that area, together with those aspects of demographic structure, general physical environment and democratic participation which may determine the extent to which needs the desires relating to the foregoing constituents of level of living can be or are met."

It can be seen that the aspects and criteria of level of living maintained by Knox are also represented in the present study. However, although Knox's definition suits the concerns of this study, the term level of living cannot be used alongside social well-being. This is because Drewnowski (1972) has equated level of living with the term 'flow of welfare'. In searching for a numerical expression for such welfare, Drewnowski uses indicators expressed in their specific units per unit of time, such as, calorie intake per day, children in school per year, and so on. On the contrary, the criteria and variables employed in this study do not relate to specific units per unit of time. They are more directly related to what Kamrany and Christakis (1970) refer to as 'relative indicators'. They are used when no optimum value is available, and simply give a measure of the relative condition of different regions or areas. Examples can be drawn from most aspects of housing, health, social stability, as revealed in this study. As Knox claims, most aspects of well-being can only be measured by way of relative indicators because the available data offer no alternative.

The above discussion reveals that it is a difficult task developing an operational definition for social well-being. Knox's definition of well-being cannot be applied to this study simply because this study is not concerned with measuring people's needs and satisfactions, neither is this

study connected with asking people how they view their own state of well-being or happiness. There are also difficulties, as already shown, in measuring people's aspirations. Harvey (1973) reminds us that felt needs are not always equivalent to real needs. Furthermore, current theory offers no solution whilst the conceptual bases of social indicators have remained vague. On the other hand the objectives and concerns of this study could be related to Pred and Knox's definitions of quality of life and level of living respectively.

Despite these difficulties, the point has been reached at which some general criteria of territorial social well-being can be listed. These can serve as a basis for an operational definition that can be used to determine how social well-being varies between census division territories. Smith (1973: 69-70), points out that it is possible to make some broad consensual statements about social well-being from the literature on sociology, social indicators, and social problems. For instance, in a well society, people will have incomes adequate for their basic needs of food, clothing, shelter and "reasonable" standard of living: people will not live in poverty. The status and dignity of the individual will be respected and he will be socially and economically mobile. Good quality education and health services will be available to all and their use will be reflected in a high level of physical and mental health and in an informed populace able to perform their societal roles, in a satisfactory manner. People will live in decent houses, in decent neighbourhoods, and will enjoy a good quality of physical environment. They will have access to recreational facilities, including culture and the arts, and adequate

leisure time in which to enjoy these things. Society will show a low degree of disorganization, with few personal pathologies, little deviant behaviour, low crime incidence and high public order and safety. The family will be a stable institution with few broken homes. Individuals will be able to participate in social, economic and political life and will not be alienated on the basis of race, religion, ethnic origin or any other cause.

From the above situation, various aspects and criteria of social well-being can be listed. Smith (1973) lists seven general criteria of social well-being: income, wealth and employment; the living environment (housing, physical environment, the neighbourhoods); health; education; social disorders (crime, public order, family breakdown, personal pathologies); social belonging (democratic participation, criminal justice, segregation); and recreation and leisure. These criteria can serve as a basis to determine how social well-being varies spatially between territories, and as a result have been employed in this study. The section below reviews some of these criteria and the variables that relate to them.

3.2 SELECTION OF CRITERIA AND VARIABLES

Using Smith's general criteria of social well-being as a major guideline, the variables were selected from a number of reports and publications on social issues (refer to data-source section).

Various problems were encountered with respect to the selection of variables, as we shall see later. However, a general problem which must be mentioned here was that the final selection of variables was restricted to

data that were readily available at the census-division level. It must also be pointed out that some criteria used in this study were added to Smith's list of criteria on social well-being. These include: ethnic diversity index, demographic variables, and the variables related to service availability. These additional criteria and variables are presented under sections on social issues in certain statistical reports such as: Ontario Statistics (Social Issues) 1975, and Perspective Canada (1974, 1977).

In general, the data assembled represent a reasonable and satisfactory, if not perfect, operational formulation of the abstract concept of social well-being, and embody many important conditions which have a bearing on the well-being of individual life. Some explanation of the selection is provided below. Definitions of the terms and concepts involved are given in Appendix A.

3.2.1 Welfare and Social Security

Statistics relating to social welfare are usually ambiguous. An increase in expenditure for unemployment insurance, for instance, signals both a weakness in the economy, and a strength in the protection of individuals and families that marks an effective social welfare system. However, the variables presented under this criterion are related to welfare expenditures directed in particular to the welfare of the disabled, children and youth, old people, dependent fathers and widows, and poor sections of the population. These are good measures of general federal, provincial and municipal attitudes towards the needs of the poor and other disadvantaged groups. As defined broadly by Merriam (1978; 118), these social

welfare programs "include programs directed specifically to the well-being of individuals and families."

Social service expenditures per capita involve federal, provincial and municipal governments and other agencies. Expenditures allocated include: family benefit allowances, general welfare assistance allowances, homes for the aged, child welfare (Children's Aid Societies). General welfare assistance allowances per capita include expenditures on allowances for supplementary aid, special assistance, general assistance and Indian assistance. Family benefit allowances per family include assistance issued under the Blind Persons Allowance Act, and the Disabled Persons Allowance Act, and assistance granted to dependent fathers and widows and unmarried women. Expenditure on the aged covers maintenance and operation of homes for the aged and elderly persons' centres. Beneficiaries of expenditures on child welfare are: children receiving protection and prevention services, children in care cases, services to unmarried parents cases, and private adoption society supervised cases.

3.2.2. Housing

Housing is important as one of the basic social and survival needs of human beings, and also because up to a certain standard it can have a bearing on other matters such as physical health and mental well-being. Housing is also important as a source of shelter, comfort and social status, as a major personal or family asset, and as an element of family and community life. Shelter, for instance, plays a role in the physical, social and psychological development of its occupants by influencing directly and

indirectly the physical and mental health of populations and by shaping group attitudes and behaviour. Housing thus performs important basic protective and symbolic functions.

The percentage of occupied dwellings with cold water only, and with no bath or shower facilities are variables selected to measure the adequacy of a home with respect to its basic physical facilities. They also reflect housing standards and household inconvenience. Occupied dwellings with only cold water and no bath/shower facilities could therefore be regarded, by modern Canadian expectations as substandard. Another indicator used to measure housing adequacy or the provision of adequate living space is the average number of rooms per dwelling. Dwellings with both colour and black and white television sets, and with two or more automobiles are associated with household amenities and conveniences, and are representative of the material 'good life'.

Tenure is an important characteristic of housing stock. Home ownership has symbolic values. Possession of a house is regarded as a valuable personal or family asset. Ownership provides security and a potential capital asset and influences residential mobility.

The percentage of dwellings overcrowded is useful in indicating the general quality of housing as it reflects the density of occupation. Overcrowded dwellings are often associated with other social problems such as ill-health. Average monthly cash rent and modern house values are indicators of rental and housing costs respectively. The cost of purchasing a home and renting an apartment or dwelling unit is always a major concern.

High costs, for instance, impose a significant burden on the family budget. On the other hand, the monetary value of housing can also indirectly reflect the general quality of housing. Values here relate to the amount which an owner would expect to receive if the dwelling were sold to a willing buyer, including the home, the land it is on, and any other building on the property (Ray, et al., 1977; 7). High values therefore could be a possible explanation for high-quality housing. The percentage of dwellings more than thirty years old measures the proportion of houses which are aging and more likely to be physically declining. It also reflects the proportion of old houses to new houses and therefore could be used to measure indirectly the proportion of housing starts.

3.2.3 Health

All aspirations to a better level of well-being are based on the assumption that people are healthy enough to enjoy it. Health is defined as a "state of complete physical, mental and social well-being and not merely the absence of disease and infirmity" (Moriyama, 1968; 585). The health status of a population, and the provision of health services and activities directed to the improvement of health conditions are therefore essential aspects of social well-being.

Crude birth rates, general death rates and more importantly infant mortality rates, as well as Wolfson's Hospital Health Index, were selected to measure the health status and levels within populations. They are also useful in indicating the need for health services. Population per doctor, population per specialist, dentists per 100,000 of population, and the

number of staffed, public, general and allied special beds per 1,000 of population were chosen as indicators of health services provision. They are health care resources, and they also determine the extent to which populations have access to medical services. Two indicators of health expenditure (expenditure per capita on hospital services by the Ministry of Health of Ontario, and OHIP payments per capita for claims for physician services) help in assessing government participation in the health field, and act as measures of the quality of hospital health care. OHIP payments per capita in a way measure individual ability to obtain health-related services.

Admissions into psychiatric hospitals can be linked to social stress, and acts as a measure of mental health. Total TB cases per 100,000 of population is associated with ill-health and poor environmental quality. Causes of death reflect the prevalence of ill-health in the population. Deaths caused by disease of the circulatory system for instance reflect the prevalence of heart and hypertensive diseases. Deaths resulting from disease of the respiratory system relate to lung abscess and pneumonia and could be associated with poor environmental conditions alongside TB cases. Deaths from all malignant neoplasms reflect a prevalence of cancer (bone, skin, breast, leukemia, etc.) in the society and may also have environmental links.

3.2.4 Population

The demographic characteristics of a population are an essential element of the social conditions of that population. These characteristics may not by themselves indicate the condition or well-being of the population,

but they also provide some insight into the basic determinants and consequences of the emergence of an advanced society.

The sex ratio measures the proportion of males per 100 females. The dependency ratio measures the impact of age composition on the livelihood activity of a population. The ratio purports to measure how many dependents must be supported by persons in the productive years (Bogue, 1969). The dependency ratio was divided into two major parts: the aged dependency ratio and the child dependency ratio. These two subdivided ratios help to reflect also the age structure of the population. Trends in the growth of the area's population are a fundamental aspect of both the character of that area and of its historical development. It also comprises a fundamental dimension of change in a society. The population growth index (1966-1971) was therefore selected not only to measure changes in the population but also to reflect migration trends occurring within the area. The average size of a family can be associated with marriage rates, birth and fertility rates. Factors like income, occupation, culture and education also have an influence on the size of families. The proportion of people living in an urban area indicates the extent to which city dwellers are subjected to new ideas that are more easily communicated by the facilities of urban life. It is a phenomenon related to the creation of political and social awareness. In urban centres, there are open spaces, work places, dwellings and communal and other facilities to promote the good life and well-being of individuals and the community.

2.5 Ethnicity

The concept of ethnic diversity provides a single summary measure of the ethnic composition of a population. The ethnic diversity of an area measures the potential for day-to-day contact of people of different ethnic origins (Ray, et al., 1976: 231). The index, apart from determining cultural differences or pluralism within a society, also reflects the ability of an area to attract immigrants from different ethnic backgrounds. On the one hand, ethnic diversity has been associated with political instability; it has also impeded the efficiency of communication among individuals (Taylor 1972; 214). On the other hand, it has pointed out that much of the vitality and creativity which have characterized societies throughout their histories can be attributed to the stimulation of the varied cultural traditions brought about by different streams of immigrants (social indicators 1976: xxx). As a result the value and enrichment of societies have been attributed to their ethnic or cultural diversity. In Canada, there has been individual and government interest in multiculturalism. Multiculturalism is used in Canada in connection with established government policies aimed at promoting the contributions of all ethnic groups to enhance a Canadian culture (Perspective Canada, 1974: 257).

3.2.6 Income and Wealth

The importance of income and wealth to social well-being is beyond dispute. Money is a necessary condition for access to such services as health and education, and to provide the basic necessities of life. Income and wealth are important because they can purchase personal power, prestige,

social and economic status, purchase more basic material wants, and give individuals command over goods and services.

A useful indicator selected to measure income levels is the average level of family incomes. Two variables were also selected to indicate the proportion of families in the extreme ends of the income distribution. The proportion of families earning less than five thousand dollars per annum is not synonymous with poverty but it is a useful indicator of a poor standard of living (Bennett, 1976; 147). On the other hand, families earning incomes of more than fifteen thousand dollars a year were in 1971, a useful indicator of a high standard of living. Retail and service receipts and sales per capita measure the extent of economic and commercial activity within an area.

3.2.7 Service Availability

Another important aspect used in determining the level of well-being in a given territory is the provision and availability of certain services and facilities. That is, determining the extent to which the inhabitants of an area have access to cultural, recreational, health and other services.

The indicators selected under this criterion represent: health and welfare services (health and welfare workers per 100,000 population); and educational and cultural services (library staff per 100,000 population). Artistic, literary and recreational services (artistic, literary and recreational workers per 100,000 population) are regarded as a rough measure of cultural growth and development. Cinemas, restaurants, and hotels and motels roughly indicate aspects of recreation and leisure, such as the growth of eating outside the home as incomes increase.

3.2.8 Social Disorder

The indicators representing this criterion relate to the state of unfortunate individuals and to the sickness of society at large. Most of the social problems included here can probably be related to such problems as inadequate income, material deprivation, employment opportunities, insecurity and loss of self-esteem. They measure the basic malfunctioning of society and a capacity to deal with such problems may be important to a society's survival.

Narcotic addiction (persons convicted under the Narcotic Control Act/100,000), crime rates (persons charged with indictable offenses/100,000), juvenile delinquency, and suicide rates, all relate to personal deviance, instability, and a behavioural response to a disorganized or stressful social environment. Juvenile delinquency and crime rates are indicators of societal propensity for violence, and suicide is a sort of escape of last resort. Family breakdown, measured here by crude divorce rates (divorce per 100,000), is another symptom of social disorganization and a causal factor in other social problems such as illegitimate births (percentage of children born to unmarried women). The number of lawyer and notary offices per 100,000 of population is a crude measure of access to legal services and has a bearing on respect for individual freedom and personal security.

3.2.9 Employment

Employment status is a source of personal status, dignity and security as well as a source of income. Employment and the capacity for self-support are therefore important in a society that places high values on economic achievement and self-reliance. Data on employment at the census division

level were limited; as a result, the variables selected were confined to employment rates, participation rates and white collar workers. Data on other aspects such as, job conditions, union membership, job satisfaction, which are also major areas of concern were difficult to obtain.

The goal of "full employment" has long been of concern to many governments. There have been major statistical efforts towards the measurement of employment and unemployment levels. Labour force participation rates reflect the proportion of the population who are of working age, and who are part of the labour force of the economy, that is, the 'economically active' part of the population. The unemployment rate and the male unemployment rate indicate the percentage of the economically-active population and males unemployed respectively. To some extent these rates indicate spare capacity in the system, but they also show people who are, temporarily at least, dependent on society at large for their well-being. The percentage of white collar workers in the labour force is a measure of occupational status. It also shows the proportion of skilled workers in the labour force.

3.2.10 Education

The importance of education to social well-being operates in a number of ways including the improvement of earning capacity, the bestowal of status and social mobility (Smith, 1973; 81). Acquisition of basic skills and knowledge, continuing self-development through advanced learning, extension of the economic potential of individuals, and inter-generational transmission of cultural values, are some of the broad concerns of education and hence social well-being.

A certain level and content of education which provides the individual with the opportunity to develop his potentials to the highest possible degree is by itself one of the main objectives of social well-being. Three levels of education are presented here. The percentage of population five years and over with an elementary level of schooling (the first level), that is, grades one to eight. This elementary level includes those with vocational training and those with no training at all. This level is defined as that designated "to provide basic instruction in the tools of learning" (Taylor, 1972; 203). The proportion of population five years and over with vocational and post-secondary non-university level of scholarship (grades 9-13), "is based upon at least four years' previous instruction at the first level and providing general or specialized instruction or both" (UNESCO, 1966; 30). Education at the third level (percentage of population five years and over with university degree only), is defined by UNESCO as that "which requires as a minimum condition of admission, the successful completion of education at the second level, or the attainment of an equivalent level of knowledge." These indicators provide an indication of the relative effort a society is making towards educating its population, as well as the extent to which the population has already been educated. They also measure, in varying degrees, the reservoir of talent available or learning modern technical skills. The second and third levels (and particularly the third) measure the extent to which the process of self-development has been achieved. Advanced education is valued by various societies as an end in itself, as a factor contributing to increased income potential, and as an element of personal enrichment. Number of pupils per teacher is used to measure the level of services, educational provision and efficiency.

3.2.11 Democratic Participation

Participation in the democratic process measured by voting rates (percentage of registered voters voting), is indicative of the extent to which individuals can and do participate in the election of their officials and representatives. It covers the degree to which individuals can participate in the democratic process, the extent to which they are treated as full members of society with all its rights and privileges. It represents a sense of social belonging. It also indicates the extent to which individuals choose to use their participatory rights.

3.2.12 Environmental Quality

Data related to environmental quality are usually concerned with the aesthetic aspects, water, air and noise pollution of the environment. There is a general awareness of the subtle but devastating effects that man-made characteristics can sometimes inflict on natural ecosystems. Man's impact on the environment is reflected in the release of pollutants which have degraded the environment. This has led to growing public concern about the quality of the environment. Diseases sometimes caused or aggravated by environmental conditions, such as bronchitis, tuberculosis, emphysema, as well as lead and mercury poisoning, have brought about misery and have also taken some human lives. Recent findings suggest that many human cancers may be triggered by environmental factors (Perspective Canada, 1977; 239).

Data on the measures of water and noise pollution as well as the ecological and aesthetic aspects of the environment were not available. As a result only measures of atmospheric pollutant emissions from point and area sources are provided. Suspended particulate is a general term applied to a wide variety of solid or liquid particles of a size and configuration such that they tend to remain suspended in the air and can thus be drawn into the respiratory passages (Souchen, 1979; 3). Particulate material is the most commonly perceived form of air contamination, often manifesting itself by interference with visibility, by its soiling effect on materials or as a respiratory irritant. Particulate air pollution originates from sources such as power generation, incineration, space heating, transportation, solid waste disposal, manufacturing or commercial operations, forest fires, iron ore mining and beneficiation, asbestos production, stone quarrying and processing, and cement manufacture. Apart from injury to the respiratory system, particulates can also combine with gaseous pollutants to form adverse impacts on human health and welfare.

Sulphur dioxide is a colourless gaseous pollutant and arises mainly from the combustion of sulphurous coals and fuel oils, and from industrial processes of petroleum refineries, sulphuric acid manufacture, the iron and steel industry and refuse incineration. Adverse effects include irritation of the respiratory system to human beings, acute or chronic leaf injury to plants, and at high levels causes poor visibility and greater corrosion rate on materials.

Nitrogen oxides and dioxides are generated by natural sources and man-made technological sources. Emissions of technological NO_2 may be from automobile exhaust, stationary combustion sources, and chemical processes. NO_2 causes toxic effects on the lungs and also reductions of visibility.

Carbon monoxide is a colourless, odourless, toxic gas arising primarily from incomplete combustion of carbonaceous fuels. Automobiles contribute the largest quantity. Adverse effects on human health and well-being have been associated with the formation of blood carboxyhemoglobin, thus decreasing the oxygen-carrying capacity of the blood and reducing the oxygen transfer to vital tissues.

SUMMARY

The variables discussed above are not mutually exclusive; neither do some of them belong specifically to one criterion. The variables are interrelated in various ways and some of them could belong to more than one criterion. Some of the health variables, such as crude birth rates, and general death rates could be regarded as demographic indicators. The degree of overcrowding in a dwelling could also come under social disorder. Furthermore, suicide rates could also come under health as a causal factor of death.

Given the present shortage of census division figures on many important social conditions, this selection of variables represents a satisfactory operational definition of the concept of social well-being

developed earlier. The above indicators are regarded as territorial indicators of social well-being. However, as a set of social indicators these data are inadequate in a number of important respects. Some of these problems are discussed below.

3.3 PROBLEMS WITH DATA

3.3.1 Input Versus Output Social Indicators

The sort of data that are needed in order to construct more sophisticated measures of well-being also ideally relate specifically to outputs of the social system rather than to inputs (Knox, 1975; 75). That is, they should measure achieved levels, rather than potentials. For example, they should relate to achieved improvements in educational levels rather than attendance at school. In short, they should relate to ends rather than means.

Moser (1971), sees the difficulties involved in developing output measures as one of the main challenges facing the social indicators movement. One of the main conceptual difficulties is that there are often ends which can also be regarded as means. In this sense, school attendance is an intermediate end, but it is really a means to the end of improved education. Recalling our earlier discussion (Chapter 2.1), social indicators are supposed to be integrated sets of direct normative measures of major dimensions. The U.S. Department of Health, Education and Welfare's definition of social indicators excludes a large part of "true" social indicators involving direct measures of health, education, criminal activity and other criteria of social well-being.

In this study some measures of inputs had to be used in the absence of output data. Many of the variables are not in fact direct measures of social well-being but are surrogates. For example, a high number of dentists, specialists and doctors is not necessarily a guarantee of a healthy population, though it makes it more likely than if there were fewer of them. Similarly, the welfare and social security variables presented in this study do not necessarily measure the impact or output of expenditures on social programs by dollars of input. Nevertheless, the variables are subject to a normative interpretation.

Although it is generally argued that for social indicator purposes output indicators are preferable to input indicators, it must be emphasized that in many areas of social concern such output indicators are neither statistically developed nor conceptually defined; therefore, input or cost data will have to be used as a surrogate measure of output (Adler, 1972; 138). Input indicators, though they may not relate to results are closely related to the priorities which society as a whole - usually through public policies - places on the social concern in question. Nevertheless research on the formulation and quantification of outputs and results is urgently needed. In the meantime, geographers must rely on the best available surrogates.

3.3.2 Ambiguity in Data

Another problem in this study which is associated with almost all social statistics is that certain of the variables used are somewhat ambiguous measures of social well-being. Another look at Chapter 3.2 helps in picking out particular variables which reflect both good and bad conditions of social well-being. A few examples are cited here.

As has been pointed out already, welfare expenditures and social securities, on the one hand, reflect a weakness in the society, and on the other hand, show how much governmental and other agencies are involved in protecting the poor and the disabled. Similarly, availability of hospital beds on the one hand indicates access to medical services, while on the other hand it could indicate the extent of illness needing hospital care. Furthermore, high psychiatric hospitalization rates may be bad because there are so many people mentally sick, and good because the sick are being identified as such and treated. The ethnic diversity index, median house values, monthly cash rents, also act as ambiguous measures of well-being as has already been shown.

3.3.3 Data Availability for 1971

An initial consideration of the study was to compile all data relating to social well-being for 1971. However, in certain cases such as: variables relating to health (T.B. cases per 100,000; population per doctor; population per specialist; Wolfson's hospital health index, hospital beds/1,000; expenditures on hospital services; and OHIP payments per capita); welfare and social security criteria; and environmental quality criteria, data for 1971 were not available. As a result, data relating to these variables were compiled from periods or years as near to 1971 as the latest available figures permitted. These periods ranged from as close as 1972 to 1974.

3.3.4 Problems with Spatial Units

The main unit of analysis employed in this study to determine broad spatial trends of social well-being within Ontario was the census division;

as a result, data for the analysis in this study were compiled at this level.

However, there was a minor problem here in that data relating to narcotic violation rates, indictable offence rates and juvenile delinquency rates had to be obtained at the Judicial District level. The problem was that in certain cases two (and in one case three) census divisions had been grouped together to form one Judicial District. For instance, the three census divisions of Stormont, Dundas and Glengarry had been grouped together to form a Judicial District. There were also five other Judicial Districts, each consisting of two census divisions - Prescott and Russell; Leeds and Grenville; Northumberland and Durham; York and Toronto; and finally Victoria and Haliburton. As a result of this grouping the total number of Judicial Districts was 47 as compared with the 54 census divisions employed in this study.

Therefore, in order to arrive at separate rates for each affected census division, such as: Stormont, Dundas and Glengarry, the populations of these three census divisions were aggregated and used as the denominator for the calculation of a rate. This eventually resulted in the three census divisions having the same narcotic violation rate, indictable offence rate and juvenile delinquency rate.

The same problem was encountered when compiling data relating to welfare and social security. In this case, three territorial districts, each consisted of two census divisions and one territorial district consisted of three census divisions. The affected census divisions were: Prescott and Russell, Leeds and Grenville, Northumberland and Durham, and finally

Stormont, Dundas and Glengarry. Here also, each of the respective groups of census divisions ended up having the same rates relating to welfare and social security expenditures.

3.4 SOURCES OF DATA

The data compiled in this study were obtained from secondary sources, particularly from government publications and reports. Most of the data were collected from Statistics Canada's 1971 census publications. Other reports consulted were: the Registrar General's report on Vital Statistics for Ontario, the Ontario Ministry of Community and Social Services report published by its research and planning branch, an annual report published by the Mental Health Division of the Health Department of Ontario, and the Ontario Statistics Social Series volume. Data on pollutant emissions in tons per year from both point and area sources were obtained from the Air Pollution Control Directorate of Environment Canada. Some health data (Wolfson's Hospital Health Index, expenditures per capita on hospital services, OHIP payments per capita, and hospital beds per 1,000 of population) were obtained from a publication by Cuyler (1978) dealing with health measurements in Ontario.

Table 3.1 provides a detailed list of data sources based on the 68 variables.

3.5 METHOD OF ANALYSIS

A Principal Component Analysis (beginning with a principal factoring without iteration*) of 68 variables relating to the social geography of

* A brief review of this method is provided in the Statistical Package for the Social Services (SPSS) Manual, 1975, p. 479.

TABLE 3.1

LIST OF CRITERIA, VARIABLES, "COMPUTER-CODE"
NAMES OF VARIABLES, AND SOURCES OF DATA

<u>CRITERIA AND VARIABLES</u>	<u>VARIABLE NAMES</u>	<u>SOURCE</u>
<u>I. WELFARE AND SOCIAL SECURITY</u>		
1. Social service expenditure per capita (\$), 1970-71	SOCIAL	1
2. General welfare assistance allowances per capita (\$) March, 1972.	WELFARE	2
3. Family benefit allowances per family (\$)	FAMBEN	2
4. Ordinary expenditures on operation and maintenance of homes for the aged per person 65 years of age and over (\$) March, 1972.	AGEEXP	2
5. Expenditure on child welfare per person between ages 0-14, (\$), March, 1972.	CHILDEXP	2
<u>II. HOUSING</u>		
6. Occupied dwellings with two or more automobiles (%) 1971.	AUTOCAR	3
7. Occupied dwellings with both black and white and colour television (%), 1971.	TV	3
8. Occupied dwellings with cold water only (%), 1971	COLDH2o	4
9. Occupied dwellings with no installed bath or shower (%) 1971.	NOBATH	4
10. Occupied dwellings more than 30 years old (%) 1971	YEARS 30	5
11. Occupied dwellings overcrowded (%) 1971	CROWDED	6
12. Occupied dwellings owned (%) 1971	OWNERS	7
13. Median value of owned houses (\$) 1971	VALUEHSE	8
14. Average monthly cash rent (\$) 1971	RENT	8
15. Average number of rooms per dwelling 1971	ROOMAVE	9

TABLE 3.1'(Cont'd. 2)

<u>CRITERIA AND VARIABLES</u>		<u>VARIABLE NAMES</u>	<u>SOURCE</u>
III. <u>HEALTH</u>			
16.	Live births per 1,000 population, 1971	BR	10
17.	Infant deaths per 1,000 population, 1971	IMR	10
18.	General death rate (death per 1,000 population 1971	GDR	10
19.	Active tuberculosis cases per 100,000 population, 1973	TB	11
20.	Dentists per 100,000 population, 1973	DENTIST	11
21.	Admissions into psychiatric hospitals per 100,000 population, 1971	PSYCH	12
22.	Deaths caused by disease of the circulatory system per 100,000 population, 1971	DRCIRC	10
23.	Deaths caused by all malignant neoplasms per 100,000 population, 1971	DRMALIG	10
24.	Deaths from disease of the respiratory system per 100,000 population, 1971	DRRESP	10
25.	Wolfson's Hospital Health Index, 1972-1973	WOLFSON	13
26.	Population per specialist, 1973	SPECIST	11
27.	Population per doctor, 1973	DOCTOR	11
28.	Number of staffed public, general and allied special hospital beds per 1,000 population, 1974	HOSPBED	13
29.	Expenditures per capita on hospital services by Ontario Ministry of Health (\$), 1974	HOSPEXP	13
30.	OHIP payments per capita for claims for physician services (\$), 1973-1974	OHIP	13
IV. <u>POPULATION</u>			
31.	Sex Ratio (proportion of males to 100 females), 1971	SEXR	14
32.	Child dependency ratio, 1971	CHILDDP	15
33.	Age dependency ratio, 1971	AGEDP	15
34.	Percentage of population - urban, 1971	URBAN	15
35.	Population growth index, 1966-1971	POPINDEX	15
36.	Average family size, 1971	FAMSIZE	16

TABLE 3.1 (Cont'd. 3)

<u>CRITERIA AND VARIABLES</u>		<u>VARIABLE NAMES</u>	<u>SOURCE</u>
V. <u>ETHNICITY</u>			
37.	Ethnic diversity index, 1971	ETHNIC	17
VI. <u>INCOME AND WEALTH</u>			
38.	Average family incomes (\$), 1971	INCOMEF	18
39.	Family incomes more than \$15,000 per annum (%), 1971	INCOME15	18
40.	Family incomes less than \$5,000 per annum (5), 1971	INCOME 5	18
41.	Net retail sales and receipts per capita (%), 1971	RETAIL	19
42.	Net sales and receipts from service trade per capita (\$), 1971	SERVICE	20
VII. <u>AVAILABILITY OF SERVICES</u>			
43.	Health and welfare workers per 100,000 population, 1971	HEALWELF	21
44.	Library staff per 100,000 population, 1971	LIBRARY	22
45.	Cinemas per 100,000 population	CINEMA	20
46.	Hotels and motels per 100,000 population, 1971	HOTEL	20
47.	Restaurants per 100,000 population, 1971	FOOD	20
48.	Artistic, literary and recreation workers per 100,000 population	ARTLIT	22
VIII. <u>SOCIAL DISORDER</u>			
49.	Suicides per 100,000 population, 1971	SUICIDE	10
50.	Percentage of children born to unmarried women out of total births (illegitimate birth rate), 1971	ILLEBORN	10
51.	Divorces per 100,000 population (crude divorce rate), 1971	CDR	23
52.	Persons charges with indictable offences per 100,000 population (indictable offence rate), 1971	CRIME	24
53.	Persons convicted under Narcotics Control Act per 100,000 population, 1971	DOPE	24
54.	Juvenile delinquency arrests per 100,000 population, 1971	JUVENILE	20
55.	Lawyer and notary offices per 100,000 population, 1971	LAW	25

TABLE 3.1 (Cont'd. 4)

<u>CRITERIA AND VARIABLES</u>		<u>VARIABLE NAME</u>	<u>SOURCE</u>
IX. <u>EMPLOYMENT</u>			
56.	Labour force participation rate, 1971	PARTRATE	26
57.	Percentage of labour force unemployed, 1971	UNEMPLOY	26
58.	Percentage of male labour force unemployed, 1971	MALEUR	26
59.	Percentage of white collar workers, 1971	WHITE	22
X. <u>EDUCATION</u>			
60.	Population five years and over with university degree only (%), 1971	DEGREE	27
61.	Population five years and over with elementary level of education (%), 1971	ELEMENT	27
62.	Population five years and over with vocational and post-secondary, non-university level of schooling (%), 1971	POSTSEC	27
63.	Pupils per teacher (elementary and secondary), 1971	PTRATIO	27 & 22
XI. <u>DEMOCRATIC PARTICIPATION</u>			
64.	Percentage of registered voters who voted in the 1971 General Election, 1971	VOTER	28
XII. <u>ENVIRONMENTAL QUALITY</u>			
65.	Particulate matter pollutant emissions in tons per year (area and point sources), 1974	SUSPART	29
66.	Sulphur oxide pollutant emissions in tons per year (area and point sources), 1974	SO2	29
67.	Nitrogen oxide pollutant emissions in tons per year (area and point sources), 1974	NO2	29
68.	Carbon monoxide pollutant emissions in tons per year (area and point sources), 1974	CO2	29

Sources of Data

1. "Family and Social Services" in Ontario Statistics: Social Series, Vol. 1, Ministry of Treasury, Economics and Intergovernmental Affairs, 1975.

▲ Table 3.1 (Cont'd. 5)

2. Ministry of Community and Social Services: Research and Planning Branch, Ontario. "Expenditures by Counties", Year Ending March, 1972.
3. Canada, Statistics Canada, 1971 Census of Canada: Housing: Household Facilities, Bulletin 2.4-4, Catalogue Number 93-737, Vol. 11, Part 4 (December, 1973).
4. Canada, Statistics Canada, 1971 Census of Canada: Housing: Bath and Toilet Facilities, Bulletin 2.4-2, Catalogue Number 93-735, Vol. 11 Part 4 (May, 1973).
5. Canada, Statistics Canada, 1971 Census of Canada: Housing: Period of Occupancy and Length of Occupancy, Bulletin 2.3-6, Cat. No. 93-731, Vol. 11, Part 3 (November, 1973).
6. "Housing and Household Equipment", Ontario Statistics: Social Service Series, Vol. 1, Ministry of Treasury Economics and Intergovernmental Affairs, 1975.
7. Canada, Statistics Canada, 1971 Census of Canada: Housing: Dwellings by Tenure and Structural Type, Bulletin 2.3-2, Cat. No. 93-727 (1973).
8. Canada, Statistics Canada, 1971 Census of Canada, Housing: Values and Rents, Bulletin 2.3-7, Cat. No. 93-732, Vol. 11, Part 3 (December, 1973).
9. Canada, Statistics Canada, 1971 Census of Canada, Housing: Rooms per Dwelling, Bulletin 2.3-5, Cat. No. 93-730, Vol. 11, Part 3, (March, 1973).
10. Registrar General, Vital Statistics for 1971, Ontario.
11. "Health", Ontario Statistics: Social Series, Vol. 1, Ministry of Treasury, Economics and Intergovernmental Affairs, 1975.
12. Mental Health Division of the Department of Health, 105th Annual Report, Ontario, 1971.
13. A.J. Cuyler, Measuring Health: Lessons for Ontario (Ontario Economic Council, 1978).
14. Canada, Statistics Canada, 1971 Census of Canada: Population: Sex Ratios: Bulletin 1.2-2, Cat. No. 92-709, Vol. 1, Part 1 (February, 1973).
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16. Canada, Statistics Canada, 1971 Census of Canada: Families: Families by Size and Type, Bulletin 2.2-2, Cat. No. 93-714, Vol. 11, Part 2, (June, 1973).

17. Canada, Statistics Canada, 1971 Census of Canada: Population: Ethnic Groups, Bulletin 1.3-2, Cat. No. 92-723, Vol. 1, Part 3, (1973).
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19. Canada: Statistics Canada, 1971 Census of Canada: Retail Trade: Business Location Statistics, Counties or Census Divisions, Cities or Towns, Cat. No. 97-703, Vol. VII, (June, 1977).
20. Canada, Statistics Canada, 1971 Census of Canada: Service Trade: Business Location Statistics, Counties or Census Divisions, Cities or Towns, Cat. No. 97-743, Vol. IX, (June, 1977)s
21. Canada, Statistics Canada, 1971 Census of Canada: Industries: Industry Divisions by Sex for Canada: Provinces and Census Divisions, Bulletin 3.4-4, Cat. No. 94-741, Vol. III, Part 4, (May, 1975).
22. Canada, Statistics Canada, 1971 Census of Canada: Occupations: Occupation Groups by Sex for Canada, Provinces Census Divisions, Bulletin 3.2-4, Cat. No. 94-718, Vol. III, Part 2, (February, 1975).
23. Canada, Statistics Canada, 1971 Census of Canada: Population: Marital Status, Bulletin 1.2-5, Cat. No. 92-717, Vol. I, Part 2, (April, 1973).
24. Canada, Statistics Canada, Judicial Division, 1971 Census of Canada: Statistics of Criminal and Other Offences, Cat. No. 85-201 Annual, (March, 1974).
25. Canada, Statistics Canada, Judicial Division, 1971 Census of Canada: Juvenile Delinquents, Cat. No. 85-202 Annual, (August, 1973).
26. Canada, Statistics Canada, 1971 Census of Canada: Labour Force and Individual Income: Labour Force Activity by Sex, Bulletin 3.1-3, Cat. No. 94-703, Vol. / III, Part 1, (January, 1975).
27. Canada, Statistics Canada, 1971 Census of Canada: Population: School Attendance and Schooling, Bulletin 1.2-8, Cat. No. 92-720, Vol. I, Part 2, (March, 1974).
28. Ontario Elections: Return from the Records: 1969 By-Election, 1971 General Election, (Toronto, March 6, 1972).
29. Environment Canada, Air Pollution Control Directorate, 1974.

Ontario was conducted.

The technique was used to extract underlying dimensions of variance by deriving a relatively small number of composite variables (components) accounting for a relatively large share of the original information. A technique that replaces one group of variables by another helps: (a) to identify groups of inter-correlated variables, (b) to reduce the number of variables studied, and (c) helps in rewriting the data set in an alternative form, with characteristics not possessed in its original state (Johnston, 1978).

The first step in the analysis was to set up a Raw Data Matrix of dimensions $m \times n$, where m is the number of variables (68) and n the units of observation (54 census divisions). The variables were expressed in the form of real numbers - ratios, rates, indices, and percentages.

Means and standard deviations were computed for each variable. Comparison of means and distributions is a rough test for normality; wherever the standard deviation is nearly as large a value as the average, the distribution is probably skewed. The variables: T.B. cases per 100,000 of population, population per specialist, the population growth index and all four pollution indices were the most obviously skewed. However, transformation to normality was not felt to be necessary, as Bennett (1977) has shown that non-normality has little impact on the solution, certainly less than the effort involved would justify.

A Correlation Coefficient Matrix of 68 columns by 68 rows with unities in the diagonal was then set up. An R-mode component analysis

explores the degree of interrelationships or covariations between all the variables, extracting the principal components which are interpreted from a matrix of component loadings.

The procedure in a principal component analysis involves the production of a new set of variables, each of which in turn is as close as possible to the original set. A matrix of component loadings therefore resulted from the correlation matrix, indicating the saturation or concentration of particular variables in a particular component. The number of components extracted equalled the number of original variables as should be the case in a principal component analysis, that is, 68. Various dimensions accounting for various proportions of the total variation were computed, as well as eigen values for each component (refer to Table 3.2). Since the variation accounted for by over three-quarters of the components was so small, the problem of "cut-offs" was vital. This is because many of the components may have consisted of errors that had been incurred in the original measurement of the data.

Various methods for determining the number of dimensions for principal component analysis have been presented. One, which was originally proposed by Kaiser (1960), is that all components having an eigen value of less than unity should be excluded. Components with such eigen values theoretically absorb less variation than can be subsumed by a single variable, and are generally ignored. Another much used criterion which King (1969) suggests is that all components contributing less than five per cent to the overall explanation should be excluded on the basis that any component explaining

TABLE 3.2

EIGEN VALUES AND PERCENTAGES OF VARIANCE FOR
FIRST FIFTEEN UNROTATED COMPONENTS

<u>COMPONENT</u>	<u>EIGEN VALUE</u>	<u>PERCENTAGE OF VARIANCE</u>	<u>CUMULATIVE PERCENTAGE</u>
1	20.67	30.4	30.4
2	10.82	15.9	46.3
3	6.74	9.9	56.2
4*	3.37	<u>5.0</u>	61.2
5	3.00	4.4	65.6
6	2.33	3.4	69.0
7	2.21	3.2	72.3
8	1.89	2.8	75.0
9	1.74	2.6	77.6
10	1.43	2.1	79.7
11	1.33	2.0	81.7
12	1.19	1.7	83.4
13**	<u>1.15</u>	1.7	85.1
14	0.93	1.4	86.5
15	0.89	1.3	87.8

* King's cut-off point.

** Kaiser's cut-off point.

less than this proportion must contain a large random-error variance. Although King's argument sounds reasonable enough, it could not be applied to this study because that would mean considering only the first four components and ignoring about 40 per cent of the variance. Kaiser's method was therefore preferred in this study, at least as a first step. This implied that the first 13 components were considered initially.

After deciding on how many components to consider when attempting a conceptual interpretation of structure, another aspect involved in the analysis was to try out a number of rotational methods available in the SPSS program. Sometimes (as was the case in this study), components are not easily interpretable because the pattern of highloading variables does not correspond simply to a single real-world dimension or a single concept. For instance, components 3, 4, 5, 6, 7 and 8 in the unrotated component matrix (of 8 components), were not easily interpretable in this study, as we shall see later. Rotational methods are usually carried out in order to place the component axes (resolution vectors) in a unique position such that the component can be interpreted by as large loadings as possible relating to the few variables possible. As each variable loads highly on only one component, the rotated components can be easily identified as associating with a specific and limited set of interrelated social conditions. Therefore, the ultimate goal of any rotation is to obtain some theoretically meaningful components and, if possible, the simplest structure (Jae-On-Kim, 1975: 484).

The 13 leading components were therefore subject to two different rotational methods (one orthogonal-varimax and one oblique rotation)

available in the SPSS program, to find out which method yielded the best interpretable results. These rotations were repeated with a smaller number of components until a clear structure emerged. As we shall see, the best solution was a varimax rotation of the first 8 components.

A graphical presentation of the 8 rotated components was also provided by the subprogram. Since only two-dimensional space (consisting of a vertical and a horizontal axis) could be effectively plotted, the subprogram took every possible pair of components one by one. As a result, 28 different plots emerged. Some information on the degree of actual correlation between the components also was obtained. Three aspects were helpful in obtaining the information: (i) the relative distance of a variable from the two axes; (ii) the direction of a variable in relation to the axes (it may indicate either a positive or negative loading); and (iii) the clustering of variables and their relative position to each other (Jae-On Kim, 1975).

Scores for each census division on those components which were deemed most important and which could meaningfully be interpreted, were then computed. The scores given for each census division on each component were examined in order to detect major breakpoints for grouping purposes. Five major groups or classes were eventually employed (refer maps 2, 3, 4, 5, 6, 7 and 8). The component scores were then mapped to portray the spatial variation of census division scores for each component. In other words, these component scores showed values for the census divisions on the new variables reflecting their value on the original variables, and the contribution each component (new variable) made to the variance of

these. As a result, the component scores formed an important part of the output of the analysis since they provided data for a new set of maps, representing the combinations of variables which made up the components. Furthermore, the score reflected interrelated sets of conditions and thus provided an effective summary of the major features of the geography of social well-being.

The final stage in the analysis involved the summation of scores for each census division on the first five components as well as components seven and eight, in order to arrive at an index of social well-being. This is justified on the ground that these sets of scores were interpreted as unambiguous composite indicators of social well-being in a certain direction. The scores were weighted in the summation in accordance with the appropriate components share of the explained variance of the original data. The summation of scores on the components mentioned above, meant that about 70 per cent of the variance in 68 original variables was represented by a single index which could be regarded in this study as a good comprehensive indicator of social well-being.

CHAPTER 4

RESULTS AND OBSERVATIONS

4.1 INTERPRETATION OF COMPONENTS

A comparison of the eight unrotated and the eight rotated components (Tables 4.1 and 4.2) reveals that the latter solution has a clearer and simpler structure. In the unrotated component matrix, Components 1 and 2 could easily be interpreted as 'General Socio-Economic Well-Being' and 'Social Stability' components respectively; however, the pattern of loadings for the other six components does not yield dimensions that can easily be interpreted.

The varimax rotation produced relatively high loadings for each variable and each component, hence clearing out some of the ambiguities that existed in the unrotated matrix of eight components. Except for Component 6, all the rotated components were easily interpretable. Component 6 was therefore dropped from the analysis, leaving seven components for consideration.

Table 4.3 shows that the seven components have eigen values above 3.0, and are thus clearly worthy of consideration. The seven components also account for almost 70 per cent of the variation in the original data matrix. These seven components may be regarded as distinctive elements of the spatial expression of social well-being in Ontario. The highest loading variables on each component are listed in descending rank order in Table 4.4. The components are examined separately below.

TABLE 4.1

STRUCTURE OF THE FIRST EIGHT UNROTATED COMPONENTS
OF SOCIAL WELL-BEING AT THE CENSUS DIVISION LEVEL

COMPONENT 1: Explained Variance 30.4 per cent

<u>Highest Loadings</u>	
RENT	0.943
INCOME1	0.940
INCOME5	-0.904
VALUEHSE	0.901
INCOME15	0.888
ELEMENT	-0.868
POSTSEC	0.863
PARTRATE	0.856
WHITE	0.855
TV	0.846
NOBATH	-0.825
COLDH2O	-0.824
URBAN	0.823
GDR	-0.722

COMPONENT 2: Explained Variance 15.9 per cent

<u>Highest Loadings</u>	
ROOMAVE	-.869
CROWDED	.815
SUSPART	.789
BR	.721
TB	.718
AGEEXP	.671
ETHNIC	.666
AGEDEP	-.592
CO2	.589
JUVENILE	.588
FAMSIZE	.586
CRIME	.562
CINEMA	.535
ILLEGORN	.517
UNEMPLOY	.509
MALEUR	.506
SOCIAL	.502

Cont'd.....

TABLE 4.1 (Cont'd. 2)

COMPONENT 3: Explained Variance 9.9 per cent

<u>Highest Loadings</u>	CHILDEXP	-.571
	SEXR	-.565
	HOSPBED	.559
	WOLFSON	.554
	HEALWELF	.545
	HOSPEXP	.536
	CHILDEXP	.519
	SERVICE	.518
	DOCTOR	-.505
	FAMSIZE	.493
	RETAIL	.489
	DRMALIG	.462
	LAW	.459
	DRRESP	.416
	DRCIRC	.411
	CDR	.406

COMPONENT 4: Explained Variance 5.0 per cent

<u>Highest Loadings</u>	PTRATIO	.550
	WELFARE	-.496
	SOCIAL	-.432
	SUSPART	.431
	PSYCH	.409
	TB	.389
	MALEUR	-.365
	HOSPBED	.353
	FAMBEN	.352
	BR	.346
	UNEMPLOY	-.344
	AGEEEXP	.324
	LIBRARY	-.315

COMPONENT 5: Explained Variance 4.4 per cent

<u>Highest Loadings</u>	POPINDEX	.477
	SERVICE	.462
	FOOD	.442
	HOTEL	.437
	HOSPEXP	-.408
	HOSPBED	-.400
	AGEEXP	.383
	YEARS30	-.350

Cont'd.....

TABLE 4.1 (Cont'd. 3)

COMPONENT 6: Explained Variance 3.4 per cent

<u>Highest Loadings</u>	
UNEMPLOY	.499
VOTER	.477
MALEUR	.468
JUVENILE	.380
HOSPBED	-.322
LAW	.321
PTRATIO	.314
ILLEBORN	+.313

COMPONENT 7: Explained Variance 3.2 per cent

<u>Highest Loadings</u>	
NO2	.470
CHILDEXP	.409
PSYCH	-.366
CO2	.359
IMR	-.340

COMPONENT 8: Explained Variance 2.8 per cent

<u>Highest Loadings</u>	
SUICIDE	-.503
PSYCH	-.381
RETAIL	.362
FOOD	.344
CO2	-.329
HOTEL	.326

NOTE: Component loadings have been rounded to three decimal places.

TABLE 4.2

STRUCTURE OF THE FIRST EIGHT ROTATED COMPONENTS
OF SOCIAL WELL-BEING AT THE CENSUS DIVISION LEVEL

COMPONENT 1: General Socio-Economic Well-Being
Explained Variance 28.45 per cent

<u>Highest Loadings</u>		
	INCOME1	0.959
	RENT	0.952
	INCOME5	-0.930
	INCOME15	0.909
	VALUEHSE	0.895
	TV	0.883
	WHITE	0.847
	POSTSEC	0.842
	ELEMENT	-0.818
	GDR	-0.799
	URBAN	0.795
	COLDH20	-0.792
	PARTRATE	0.791
	NOBATH	-0.773
	AGEDEP	-0.763
	YEARS30	0.738
	DEGREE	0.728
	AUTOCAR	0.709
	DRCIRC	-0.704

COMPONENT 2: Social Stability
Explained Variance 12.28 per cent

<u>Highest Loadings</u>		
	SUSPART	0.878
	TB	0.849
	AGEEXP	0.842
	BR	0.780
	CROWDED	0.683
	ROOMAVE	-0.679
	ILLEBORN	0.652
	ETHNIC	0.636
	JUVENILE	0.618
	CO2	0.581
	SEX	0.570
	CINEMA	0.557
	CHILDDEP	0.472
	CRIME	0.466

Cont'd.....

TABLE 4.2 (Cont'd.)

<u>COMPONENT 3:</u> General Unemployment		
Explained Variance 6.88 per cent		
<u>Highest Loadings</u>	UNEMPLOY	0.903
	MALEUR	0.885
	WELFARE	0.549
	ROOMAVE	-0.546
	SOCIAL	0.450
 <u>COMPONENT 4:</u> Health Resource Provision		
Explained Variance 7.48 per cent		
<u>Highest Loadings</u>	HOSPEXP	0.866
	HOSPBED	0.838
	WOLFSON	0.708
	OHIP	0.635
	HEALWELF	0.493
	DOCTOR	-0.451
 <u>COMPONENT 5:</u> Mental Health-Stress		
Explained Variance 5.44 per cent		
<u>Highest Loadings</u>	SUICIDE	0.633
	PSYCH	0.599
	HEALWELF	0.503
	SEXR	0.455
 <u>COMPONENT 6:</u>		
Explained Variance 5.19 per cent		
<u>Highest Loadings</u>	PTRATIO	-0.616
	VOTER	-0.581
	SOCIAL	0.578
	LIBRARY	0.533
	FAMBEN	0.501
	WELFARE	0.486
 <u>COMPONENT 7:</u> Air Quality		
Explained Variance 4.67 per cent		
<u>Highest Loadings</u>	NO2	0.724
	CO2	0.667
	CHILDEXP	0.494
 <u>COMPONENT 8:</u> Recreational Services		
Explained Variance 4.66 per cent		
<u>Highest Loadings</u>	SERVICE	0.656
	RETAIL	0.663
	FOOD	0.582
	HOTEL	0.578
	LAW	0.437

NOTE: Component loadings have been rounded to three decimal places.

TABLE 4.3

EIGEN VALUES AND PERCENTAGES OF VARIANCE
FOR THE FIRST EIGHT ROTATED COMPONENTS

<u>COMPONENT</u>	<u>EIGEN VALUE</u>	<u>PERCENTAGE OF VARIANCE</u>	<u>CUMULATIVE PERCENTAGE</u>
1	19.346	28.45	28.45
2	8.353	12.25	40.73
3	4.679	6.88	47.61
4	5.084	7.48	55.09
5	3.702	5.44	60.53
6	3.528	5.19	65.72
7	3.174	4.67	70.39
8	3.168	4.66	75.05

Component 1 (explained variance: 28.45 per cent).

The most important component is a general and broadly defined component accounting for over a quarter of the variance of the original data matrix. A cut-off point of 0.7 was selected for the loadings on this component.

The component is a product of the general constituents or criteria of social well-being and in this sense could be termed a "General Socio-Economic Well-Being" component. Income, housing, education, employment, urbanization and health are represented strongly. Both the high positive and the high negative loadings of these criteria suggest a general state of socio-economic well-being. Table 4.4 reveals that this predominant dimension groups together high family incomes, relatively expensive and sound housing (housing costs), household conveniences and amenities (occupied dwellings with both colour and black and white TV, and with two or more cars), high educational achievement (proportion of population with post-secondary and vocational non-university level of schooling, as well as with a university degree), high occupational status (white collar workers), and a high proportion of urban populations. On the other hand, high negative loadings are associated with mortality rates, low quality housing, elementary education levels and age dependency ratios.

The importance of the socio-economic variables, particularly those with positive loadings, led to the decision to label this dimension "General Socio-Economic Well-Being". High positive scores on this component therefore indicate sub-divisions with a good state of material well-being.

Component 2 (explained variance: 12.28 per cent)

The second component is much smaller, but contains a number of variables for which the loadings are strong (between .47 and .88). On the positive side these consist of variables relating to air pollution, ill-health in the form of tuberculosis, overcrowded dwellings, illegitimate births, juvenile delinquency and indictable offence rates, dependency ratios, ethnic diversity, the incidence of cinemas, and welfare programs connected with the aged. These variables indicate that this component is obviously related to social issues, particularly social disorganization. The component has therefore been designated a "social stability" component.

In general, the direction of high loadings on this component is such that high positive scores will indicate generally poor social conditions and a high incidence of social instability.

Component 3 (explained variance: 6.88 per cent)

The loadings of greatest magnitude on Component 3 are directly associated with unemployment. This obviously suggests that the component can be labelled a "General Unemployment" component. High positive scores here identify areas with high rates of unemployment.

Component 4 (explained variance 7.48 per cent)

Component 4 is obviously associated with health. Most of the variables are associated with the provision of health resources in the form of health and hospital service expenditures, as well as health and medical services. An exception is the Wolfson's hospital health index, an index relating to sickness requiring hospitalization and hence reflecting a measure of health

status. Therefore, although this component could be regarded generally as a "health" component, it has been specifically labelled a "Health Resource Provision" component. High positive scores indicate areas well-provided with health resources.

Component 5 (explained variance: 5.44 per cent)

Component 5 is associated with high suicide rates and high admission rates in psychiatric hospitals. Another relatively strong loading (.50) is that with health and welfare workers. This component therefore describes a dimension that should identify census divisions in which a prevalence of stress exists. These places may or may not be those with high levels of social disorganization. For descriptive convenience the component has been called a "Mental Health-Stress" component.

Component 6 (explained variance: 5.19 per cent)

Component 6 is difficult to interpret. The high loading variables include a mixture of negative loadings on pupil-teacher ratios and voter turnout rates, and positive loadings on welfare expenditures and library staff workers. This component was eliminated from the analysis as a detailed interpretation was not justifiable.

Component 7 (explained variance: 4.67 per cent)

Component 7 accounts for just under 5 per cent of the total variance and is highly loaded on by two outstanding variables which relate to air pollutant emissions. This component, therefore, appears strongly to describe an "Air Quality" dimension. High positive scores on this component indicate poor air quality conditions.

Component 8 (explained variance: 4.66 per cent)

The prominence of service and retail sales and receipts, restaurants, hotels and motels here suggest that this component is a "service" component. However, the inclusion of restaurants, hotels and motels suggests that the component is associated more with recreational services than any other type. The component can therefore be labelled a "Recreation Service" component.

4.2 GRAPHICAL PRESENTATION OF COMPONENTS

Figures 4.1 to 4.5 provide a graphical presentation of the varimax rotated components. These graphs provide information on the degree of correlation between the components and the input variables. In all, 28 different plots were provided by the subprogram. However, since it is not very fruitful to consider all the different plots separately, 5 out of the 28 have been selected for presentation here. The other plots are provided in Appendix B.

This graphical presentation of pairs of components, offers an effective summary by which relationships between the input variables and the respective components can be detected almost immediately or without much trouble. Also, although the orthogonally rotated dimensions are independent of each other and are therefore uncorrelated, the graphical presentation does act as a useful device whereby some degree of correlation between various subgroups of variables can be identified.

4.3 Interpretation of Component Scores

The census division scores on the seven components of social well-being were mapped. The geographical patterns are examined below.

FIGURE 4.1 GRAPHICAL PRESENTATION OF COMPONENTS 1 AND 2.

FIGURE 4.2 GRAPHICAL PRESENTATION OF COMPONENTS 1 AND 4.

FIGURE 4.3 GRAPHICAL PRESENTATION OF COMPONENTS 2 AND 3.

HORIZONTAL FACTOR 2		VERTICAL FACTOR 3			
	57	58		1 - SOCIAL	2 - WELFARE
				3 - FAMISH	4 - AGESXP
				5 - CHILDENP	6 - AUTOCAR
				7 - TV	8 - COLDMED
				9 - NOBATH	10 - YEARS30
				11 - CROWDED	12 - OWNERS
				13 - VALUEHSE	14 - RENT
				15 - ROOMAVE	16 - RR
				17 - IMR	18 - CDR
				19 - TB	20 - DENTIST
				21 - DOCTOR	22 - PSYCH
				23 - DRCLRC	24 - DRMALIG
				25 - DRESBP	26 - VOLFSOM
				27 - SPECIST	28 - HOSPEDO
				29 - HOSPEXP	30 - OHIP
				31 - SEXR	32 - CHILDOEP
				33 - AGEDBP	34 - URBAY
				35 - POPINDEX	36 - FAMSIZ
				37 - ETHNIC	38 - INCOME
				39 - INCOME15	40 - INCOME
				41 - RETAIL	42 - SERVICE
				43 - HEALTHELF	44 - LIBRARY
				45 - CINEMA	46 - HOTEL
				47 - FOOD	48 - ARTLIT
				49 - SUICIDE	50 - ILLBORN
				51 - CDR	52 - CRIME
				53 - DOPE	54 - LAW
				55 - JUVENILE	56 - PARTNATE
				57 - UNEMPLOY	58 - MALEVR
				59 - WHITE	60 - DEGREE
				61 - POSTSEC	62 - ELEMENT
				63 - PTRATIO	64 - VOTER
				65 - SUSPART	66 - S02
				67 - NO2	68 - CO2

FIGURE 4.4 GRAPHICAL PRESENTATION OF COMPONENTS 4 AND 5.

HORIZONTAL FACTOR 4		VERTICAL FACTOR 5	
49	22	43	
21	36	66	
31			
32	35	6227	
	11		
		16	
		3938	
		52	
		37	
		53	
		30	
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		100	

FIGURE 4.5 GRAPHICAL PRESENTATION OF COMPONENTS 7 AND 8.

HORIZONTAL FACTOR 7	VERTICAL FACTOR 8		
		1 - SOCIAL	2 - WELFARE
		3 - FAMBEN	4 - AGEEXP
		5 - CHILDEP	6 - AUTOCAR
		7 - TV	8 - COLDH20
		9 - NOBATH	10 - YEARS30
		11 - CROWDED	12 - OWNERS
		13 - VALUENSE	14 - RENT
		15 - ROOMAVE	16 - BA
		17 - IMR	18 - GDR
		19 - TB	20 - DENTIST
		21 - DOCTOR	22 - PSYCH
		23 - DRCLIC	24 - DRMAL10
		25 - DRRESP	26 - VOLFSBN
		27 - SPECIST	28 - HOSPERD
		29 - HOSPERP	30 - DRHP
		31 - BEXR	32 - CHILDEP
		33 - AGEDEP	34 - URSAN
		35 - POPINDEX	36 - FAMSIZE
		37 - ETHNIC	38 - INCOTEP
		39 - INCOME45	40 - INCOMES
		41 - RETAIL	42 - SERVICE
		43 - HEALWELF	44 - LIBRARY
		45 - CINEMA	46 - HOTEL
		47 - FOOD	48 - ARTLIT
		49 - SUICIDE	50 - ILEBORN
		51 - CDM	52 - CRIME
		53 - DUPE	54 - LAV
		55 - JUVENILE	56 - PARTRATE
		57 - UNEMPLOY	58 - MALEUR
		59 - WHITE	60 - DEGREE
		61 - POSTSEC	62 - ELEMENT
		63 - PTRATIO	64 - VOTER
		65 - SUSPART	66 - SUG2
		67 - NO2	68 - CU2

4.3.1 The General Socio-Economic Well-Being Component

The general pattern of socio-economic well-being in Ontario reveals that areas with relatively high to high levels of general socio-economic well-being in part coincide with the areas of greatest urbanization, industrialization and, to a lesser extent, agricultural development.

A striking feature of Map 2 is that the census divisions with high socio-economic well-being levels contain the large urban and industrial cities, particularly Census Metropolitan Areas and Census Agglomerations. As a result there is a concentration of relatively high levels of general socio-economic well-being in the southwestern region of Ontario and, on the other hand, pockets of high well-being levels in the rest of Ontario. From this perspective, it could be inferred that socio-economic characteristics ascribed to entire census divisions can be largely the result of conditions in one or two major cities.

Areas reflecting a good state of socio-economic well-being include, in descending order: Peel (Brampton), Halton (Oakville), Ottawa-Carleton (Ottawa), York, Toronto, Ontario (Oshawa), Middlesex (London), Frontenac (Kingston), Waterloo (Kitchener), Lambton (Sarnia), Essex (Windsor), Sudbury, Wellington (Guelph), Niagara (St. Catharines), Peterborough, Wentworth (Hamilton), Algoma (Sault Ste. Marie), Simcoe (Barrie), Brant (Brantford), Leeds (Brockville), and Nipissing (North Bay). On the other hand, areas having generally low levels of socio-economic well-being include: the census divisions bordering Georgian Bay and Lake Huron - Muskoka, Manitoulin, Bruce, Grey, Huron and Parry Sound; the eastern fringes on Ontario - Prescott, Russell, Stormont, Dundas, Glengarry, Grenville and Lanark which

MAP 2. CENSUS DIVISION PERFORMANCE ON THE GENERAL SOCIO-ECONOMIC WELL-BEING COMPONENT.

are essentially depressed rural areas; the south-central districts of Victoria, Haliburton, Prince Edward, Northumberland and Durham; the Lake Erie counties of Haldimand and Norfolk; and finally Rainy River, Timiskaming, Cochrane and Kenora in Northern Ontario. Areas occupying a transitional position between relatively low to relatively high levels include: Renfrew, Hastings, Lennox and Addington in east-central Ontario; Kent, Elgin, Oxford and Dufferin in southwestern Ontario and Thunder Bay in northwestern Ontario.

The concentration of high socio-economic well-being levels in the western littoral of Lake Ontario, from Oshawa (Ontario) to Waterloo to Niagara is explained by the fact that there is a strong concentration of rapidly growing centres within this crescent of land. This area is known as the 'Golden Horseshoe' area and contains almost 60 per cent of the 5.5 million people in Ontario who live in urban centres of at least 1,000 population (Marshall, 1972; 67). The Golden Horseshoe area is viewed as the principal node in a system of transportation corridors which for some time has served as the locus of population concentration and economic development in southern Ontario (Whebell, 1969). The Lake Iroquois plain between Hamilton and Toronto is composed of low density housing, light industry and shopping plazas. Also there are four southern Ontario metropolitan areas west of Toronto compared with only one to the east. Furthermore, in each of the urban size groups (2,500 - 5,000; 5,000 - 10,000 and 10,000 - 30,000) there are at least twice as many centres west of Toronto as east of it (Spelt; 1968). The emergence of Toronto as Canada's largest centre in terms of market potential has thus been linked with the emergence of a distinct cluster of southwestern Ontario urban centres (King; 1966). This implies that Metro Toronto has an influence on the socio-economic characteristics

TABLE 4.4

CENSUS DIVISION SCORES AND RANKS ON THE LEADING
COMPONENTS OF SOCIAL WELL-BEING

CENSUS DIVISION	COMPONENT 1	RANK	COMPONENT 2	RANK	COMPONENT 3	RANK	COMPONENT 4	RANK
Algoma	0.373	17	1.252	5	0.915	11	-0.079	32
Brant	0.184	19	-0.729	49	0.679	13	0.766	12
Bruce	-1.164	49	-0.097	20	-1.301	48	-0.187	35
Cochrane	-0.446	36	1.571	3	2.471	1	-0.114	33
Dufferin	-0.004	25	0.198	12	-1.562	54	-0.001	28
Dundas	-1.185	50	-0.730	50	-1.417	50	-0.891	11
Durham	-0.167	29	-0.493	38	-0.618	39	-0.404	38
Elgin	-0.048	26	-0.282	31	-0.601	38	-0.098	24
Essex	0.620	11	-0.349	34	0.946	10	0.190	21
Frontenac	0.949	8	-0.033	17	0.380	20	2.447	1
Glengarry	-1.750	53	-0.926	53	0.169	23	0.267	20
Grenville	-0.285	32	-0.242	28	-0.488	35	-1.156	47
Grey	-0.751	42	-0.169	43	-0.822	43	0.917	10
Haldimand	-0.339	35	-0.320	33	-1.455	51	-0.421	40
Haliburton	-1.514	52	-0.655	46	-0.089	24	-1.721	50
Halton	2.573	2	-0.251	29	-0.619	40	0.845	45
Hastings	-0.054	27	0.053	15	0.098	25	0.514	15
Huron	-0.849	44	-0.177	23	-1.549	53	0.463	16
Kenora	-0.499	39	5.51	1	-1.111	45	-0.679	44
Kent	0.030	24	-0.125	22	-0.329	34	0.555	14
Lambton	0.641	10	-0.254	30	0.448	18	-0.0004	29
Lanark	-0.490	38	-0.192	24	-1.379	49	1.539	4
Leeds	0.177	20	-0.220	26	-0.201	31	-0.285	37
Lennox and Addington	-0.191	30	-0.292	32	-0.544	37	-1.755	51
Manitoulin	-1.931	54	-0.979	8	-1.473	52	-0.530	42
Middlesex	1.196	7	-0.230	27	-0.208	21	0.947	9
Muskoka	-0.856	43	-0.636	45	0.583	14	0.063	27

Cont'd....

TABLE 4.4 (Cont'd. 2)

CENSUS DIVISION	COMPONENT 1	RANK	COMPONENT 2	RANK	COMPONENT 3	RANK	COMPONENT 4	RANK
Niagara	0.575	14	-0.098	21	0.479	17	0.123	22
Nipissing	0.157	21	0.748	9	1.408	5	-0.038	30
Norfolk	-0.332	34	-0.217	25	-1.231	47	-0.068	31
Northumberland	-0.208	31	-0.668	47	-0.081	28	-0.905	46
Ontario	1.411	6	0.217	11	0.516	16	-2.131	54
Ottawa-Carleton	1.988	3	-0.492	37	-0.239	32	0.323	18
Oxford	0.036	23	-0.383	35	-0.534	36	0.082	26
Parry Sound	-1.474	51	0.029	16	0.543	15	0.678	13
Peel	2.775	1	0.169	13	0.837	44	-1.929	53
Perth	-0.327	33	-0.578	42	-1.208	46	1.685	2
Peterborough	0.529	15	-0.648	44	1.109	9	1.178	7
Prescott	-1.104	48	-0.736	51	2.253	2	-1.678	49
Prince Edward	-0.866	45	-0.871	52	-0.014	26	-1.553	48
Rainy River	-0.511	40	1.708	2	-0.106	29	1.117	8
Renfrew	-0.131	28	0.084	14	1.220	7	-0.429	41
Russell	0.919	47	-0.708	48	1.231	6	-1.844	52
Simcoe	0.226	18	-0.078	18	-0.128	30	-0.200	36
Stormont	-0.486	37	-0.504	39	1.685	4	1.211	6
Sudbury	0.617	12	1.256	4	-0.077	27	-0.417	39
Thunder Bay	0.071	22	1.228	6	0.772	12	1.644	3
Timiskaming	-0.899	46	0.996	7	1.785	3	0.304	19
Toronto	1.585	5	0.480	10	0.200	22	0.414	17
Victoria	-0.673	41	-1.026	54	0.431	19	-0.581	43
Waterloo	0.869	9	-0.085	19	-0.327	33	-0.172	34
Wellington	0.600	13	-0.512	40	0.804	42	0.086	25
Wentworth	0.508	16	-0.453	36	1.139	8	1.520	5
York	1.664	4	-0.570	41	-0.666	41	0.099	23

Cont'd.....

TABLE 4.4 (Cont'd. 3)

CENSUS DIVISION	COMPONENT 5	RANK	COMPONENT 7	RANK	COMPONENT 8	RANK	INDEX OF SOCIAL	RANK
							WELL-BEING	
Algoma	-0.888	45	-0.414	37	0.044	19	-0.047	32
Brant	-0.296	33	0.229	17	-0.369	40	0.141	18
Bruce	-0.297	34	0.683	9	0.088	23	-0.264	44
Cochrane	-0.119	29	0.034	24	-0.988	47	-0.539	52
Dufferin	-0.092	28	-0.969	49	-0.039	20	0.134	19
Dundas	-0.808	43	0.770	7	-0.545	42	-0.101	36
Durham	-1.255	51	0.488	10	-1.256	54	0.055	23
Elgin	1.042	8	-0.212	33	-0.359	39	0.006	28
Essex	-0.427	39	0.940	5	-0.036	21	0.146	17
Frontenac	0.929	9	-0.857	47	-0.254	34	0.409	6
Glengarry	-2.273	53	-0.446	11	-1.078	49	-0.323	46
Grenville	1.811	3	-0.074	29	-1.098	50	-0.250	43
Grey	0.701	12	0.292	15	0.127	15	-0.058	33
Haldimand	-0.911	48	-0.059	28	-0.253	33	0.052	24
Haliburton	0.557	15	0.357	14	4.267	1	-0.333	47
Halton	-0.319	36	-1.610	54	-0.069	22	0.832	1
Hastings	-0.398	20	-0.307	34	0.145	17	0.012	27
Huron	0.406	19	-0.001	26	-0.776	45	-0.137	40
Kenora	0.869	10	0.732	8	0.228	13	-0.864	54
Kent	-0.190	31	-0.314	36	-0.153	29	0.106	20
Lambton	-0.301	35	-0.189	32	-0.124	27	0.202	11
Lanark	1.221	6	-0.759	45	0.211	14	0.073	22
Leeds	2.319	1	-0.718	43	-0.143	28	-0.029	29
Lennox and Addington	-0.139	30	-0.558	41	-0.955	46	-0.123	37
Manitoulin	0.041	25	-0.312	35	-0.208	31	-0.605	53
Middlesex	1.265	5	0.087	20	-0.123	16	0.358	7
Muskoka	0.023	26	0.165	18	2.945	2	-0.044	31

Contd.....

TABLE 4.4 (Cont'd. 4)

CENSUS DIVISION							INDEX OF SOCIAL	RANK
	COMPONENT 5	RANK	COMPONENT 7	RANK	COMPONENT 8	RANK	WELL-BEING	
Niagara	-0.281	32	0.363	13	0.285	12	0.164	15
Nipissing	0.604	14	-1.297	53	-0.091	24	-0.123	38
Norfolk	-1.097	49	0.368	12	-0.354	38	0.038	26
Northumber- land	0.731	11	0.079	21	-0.271	36	-0.095	35
Ontario	1.081	7	-0.728	44	-0.233	32	-0.215	10
Ottawa- Carleton	0.147	24	1.533	2	-0.108	26	0.582	4
Oxford	0.673	13	-0.101	30	-0.571	43	0.042	25
Parry Sound	-0.621	41	-0.431	38	1.837	4	-0.270	45
Peel	-0.907	47	-0.455	39	0.075	18	0.756	2
Perth	-0.609	40	0.119	19	-0.762	44	0.179	12
Peterborough	0.248	22	-1.031	50	0.762	6	0.312	8
Prescott	-0.890	46	0.063	22	-0.259	35	-0.471	49
Prince Edward	1.668	4	1.255	3	-1.203	52	-0.460	50
Rainy River	0.797	42	-1.134	52	0.735	7	-0.134	39
Renfrew	0.284	21	-0.833	46	-1.003	48	-0.187	41
Russell	-1.147	50	-0.019	27	-1.127	51	-0.386	48
Simcoe	0.452	18	0.496	40	0.701	8	0.099	21
Stormont	-0.422	38	-0.571	42	-0.315	37	-0.067	34
Sudbury	-3.084	54	-0.039	23	0.292	11	0.175	13
Thunder Bay	0.173	23	-0.949	48	-0.108	25	0.031	30
Timiskaming	0.543	16	0.781	6	-1.233	53	-0.478	51
Toronto	0.533	17	5.384	1	0.542	10	0.154	16
Victoria	1.937	2	-0.172	31	0.801	5	-0.199	42
Waterloo	-1.275	52	0.270	16	2.336	5	0.433	5
Wellington	-0.326	37	0.010	25	-0.462	41	0.291	9
Wentworth	-0.039	27	1.161	4	-0.198	30	0.174	14
York	-0.845	44	-1.079	51	0.553	9	0.719	3

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of the southwestern region and, as a result, it comes as no surprise that Metro Toronto and its adjacent census divisions - Peel, Halton, York and Ontario - rank among the top six census divisions in terms of the general socio-economic conditions in Ontario (Table 4.4).

Apart from cities concentrated in and around the Golden Horseshoe area, Ottawa, Kingston-Frontenac and Peterborough are good examples of cities drawn from outside the core area which experienced rapid growth. Trenton-Hastings and Prescott have been described as slow-growth centres. Prescott, which lost an important trans-shipment function with the opening of the St. Lawrence Seaway in 1959 is actually declining in population (Marshall; 1972). Parry Sound and Kincardine-Bruce are also experiencing decline due to net out migration. However, the situation in Bruce may be changing with the construction of the Bruce Nuclear Power Complex in the 1970's. Deep River-Renfrew is the principal dormitory settlement for the nearby atomic energy research installation at Chalk River but in addition is a dormitory for the large army base at Camp Petawawa-Renfrew.

Major socio-economic well-being disparities existing between the sections to the west and east of the Ontario district (Oshawa), are not only attributable to levels of urban development but also to industrial development. Industrial expansion to the west of Toronto has tended to link the area along the lakeshore via Oakville (Halton) with Hamilton (Wentworth), and from the northwestern industrial suburbs via Brampton (Peel), Georgetown and Acton (Halton), to Guelph (Wellington) and Waterloo. Both Brampton and Oakville are the sites of large automobile plants. Several oil refineries are located on the shores of Lake Ontario between Toronto and Hamilton.

Three major industrial regions in the southwestern region of Ontario are closely associated with the socio-economic well-being patterns prevailing in the region. They are the Western Lake Ontario region (the Golden Horseshoe), the London area (Middlesex), and the Lake St. Clair region (Essex and Lambton). The Western Lake Ontario region is actually a merger of three long-established concentrations, the Hamilton-Niagara district, the Middle Grand area and the Toronto conurbation. Most of the industries in this region are predominantly diverse in character. In the Hamilton-Niagara area, there are metal industries, iron and steel complexes, nickel refineries and a highly diversified automotive complex in the St. Catharines-Niagara area. Other important categories include: electrical products mainly in Metro Hamilton, paper manufacturing, chemicals, textiles, non-metallic mineral products and finally food and beverages. The middle Grand industrial area which includes Kitchener and Waterloo (Waterloo district) and Guelph (Wellington), has an industrial matrix which is quite diversified almost entirely in the field of secondary industries, rubber being a very important exception. Its main industries are: the manufacture of electrical products and the food and beverage industry. The Toronto industrial area contains nearly all the major industrial groupings except for primary industries. The leading category is iron and steel products, particularly agricultural implements, sheet metal products, iron castings and different types of machinery and equipment. Food and beverages, electrical products, printing and publishing, are also strongly represented in this area.

Essex's (Windsor) manufacturing in the Lake St. Clair region is based on the automobile industry. The distilling industry is the oldest leading

industry here. Lambton (Sarnia) is the centre for rapidly expanding petrochemical activity; it also has a fertilizer complex. Sarnia has become known as Ontario's "chemical valley" (Spelt; 1968). The London area in Middlesex has the feed and beverage industry as its leading employer. Other industries are the printing, publishing and allied industries, metal fabricating and the established Ford automobile assembly plant.

On the other hand, there is a relatively small amount of manufacturing to the east of Toronto Oshawa. The census divisions in this part of Ontario have less than one-third of Metro Toronto's total employment in manufacturing (Spelt, 1968; 369). Manufacturing at Peterborough, Kingston (Frontenac) and Ottawa is more of the nature of isolated developments, separated by rural areas. Peterborough started as a centre for settlement and a supply base after which it soon took a lively part in the lumber trade. Saw mills and flour mills are important here. Because of its power supply from the Otonabee River, Peterborough has attracted some industries, and has benefited from an influx of British and American capital (Spelt; 1968: 369). It became a source for flour milling and breakfast cereal production. Peterborough is second to Ottawa as the largest concentration in Southern Ontario to the east of Oshawa-Ontario. Ottawa makes a significant contribution to both Ontario and national manufacturing in the form of research. Its major manufacturing category is printing and publishing.

It comes as no surprise that the dominant mining centres of the region - Algoma and Sudbury - emerge as areas with high levels of socio-economic well-being. As a matter of fact, a pattern that has emerged with respect to the region's socio-economic conditions is one of generally low levels in the northwestern section comprising Kenora, Thunder Bay and Rainy River; and generally high levels in the northeastern section with respect to Algoma, Sudbury, Nipissing, and with the exception of Timiskaming and Cochrane. Personal incomes are higher, in fact, in the urban districts of Algoma and Sudbury to the extent that their average incomes exceed the provincial average (Ontario Economic Council, 1976).

A disparity also occurs between the agricultural development of various regions, and this can to some extent be linked with the general socio-economic well-being conditions in Ontario. This disparity in agricultural development can be traced to a number of factors. Basic physical controls relating to weather, soil and topography, for example, do exert their influence on the differences of agricultural land use. These agricultural hazards coupled with other factors such as proximity to markets for agricultural products, availability of capital and competition from other sectors like manufacturing, in terms of labour, affect the livelihood of farmers and the population within these areas.

Southwestern Ontario again emerges as the most outstanding region, this time in terms of agricultural development. It has a fairly high percentage of high quality land and benefits from its gently undulating topography and longer warm season. Commercial and intensive agriculture are practised and a great deal of crop specialization occurs. The longer growing season permits the production of higher valued cash crops so that net increases in

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farm acreage are occurring despite losses due to urban expansion and highway building (Ray, 1972; 51). Within this region is the agricultural heartland where a high proportion of total farmland centres around Waterloo, Middlesex, Brant and Oxford. The agricultural heartland area is adaptable for cultivated crops, and has a high percentage of good quality land; the variable soils permit diversification and the climate of the lakeshore area is especially suitable for tender fruit trees (Reed, 1959; 226). The region is an important dairy farming, mixed farming and livestock producing area.

The Lake St. Clair region, which includes the important cash crop areas of Essex and Kent, has become Ontario's leading producer of wheat, hay, oats, mixed grain and corn. The region has a rich and varied agriculture which has made foods and beverages the third major industrial activity. Other important areas within the southwestern region include: the Niagara region, noted for its fruits, especially apples; Simcoe and York, leading vegetable producers; and the Peel and Halton plains where mixed farming, dairying and market gardening are practised. The Lake Erie counties of Haldimand and Norfolk which display low levels of socio-economic well-being (although not as low as the fringe areas of eastern Ontario and the Georgian Bay area) are characterized by sand plains which are moisture deficient and have low inherent fertility. The Haldimand clay plain is characterized by poor drainage in association with heavy subsoil. The soil lacks natural fertility so that less than half of the Haldimand area is farmland. The Lake Erie districts, however, thrive on tobacco production. The area was formerly a depressed area until the advent of tobacco growing in Norfolk and its adjoining areas.

The southwestern region therefore is generally a rich agricultural region with a prosperous commercial agriculture which has resulted in net increases in farm acreage and incomes. Conversely, farm acreage losses have been greatest to the north (Lake Huron area), and east of this region where the prevalent shallow and rocky soils, unsuited to mechanization, are being abandoned or reforested. The Precambrian bedrock of the Canadian shield, which occupies a somewhat central position in southern Ontario, with its protruding rock knobs and intervening pockets of sand, silt and clay, consists of shallow and excessively stony soils and this has affected agriculture particularly on the flanks of the Frontenac axis in eastern Ontario; central Ontario in Victoria, Haliburton, Muskoka and Parry Sound; and the northern parts of southwestern Ontario around the Bruce peninsula and along the margins of the shield (Bruce, Gray and Huron). Prince Edward census division also has more than half of its area with shallow and dry soils.

The bulk of reduced acreage has occurred in the districts of Parry Sound, Muskoka, Haliburton, Victoria, Hastings and Renfrew where land quality is low. The advent of high labour costs, a dwindling labour supply and an unwillingness to adjust to new technology forced the operators out of business (Reeds, 1972; 15). Thousands of acres have been abandoned while other farms have been enlarged and are being used mainly as ranches.

Studies of agriculture in Eastern Ontario suggest that about a quarter of the land farmed is better suited to forestry and that a third of the farms are not in fact viable (Noble, 1965). Due to Eastern Ontario's less favourable physical environment and smaller urban markets for agricultural products, average net incomes have been found to be less than half the provincial

average income for wage earners; too low to support an adequate standard of living or level of socio-economic well-being (Ray, 1972; 51). This region of low income in the dairy belt of Eastern Ontario extends westward across the cattle districts of Haliburton and Victoria to Georgian Bay and Lake Huron. Farm poverty in these regions thus combines with their lagging industrial and urban development in characterizing them as areas of generally poor socio-economic well-being conditions.

With regard to Northern Ontario, the region's relative emptiness is attributable to the environmental limitations. A short growing season combines with the limited arable land of the Canadian shield to keep agriculture to a minimum, and the area's low market potential inhibits the development of diversified manufacturing and central place towns. Weather hazards prohibit the production of many cash crops. Sheer distance to markets restricts attempts at crop specialization. Also few farmers in the region have the necessary knowledge and the capital to be successful (Kent; 1966).

The great clay belt, better known as the Cochrane clay belt, is the largest area of potentially arable land; although this vast plain is accessible to settlement, only a few thousand acres are presently in use as agricultural land. The most obvious feature in this clay belt is the lack of a regional pattern. Farming has been limited to dairying, mixed farming and a number of specialized farms. The majority of mixed farms are small and operate at a bare subsistence level. Many farmers operate on a part-time basis and farms are actually in a run-down condition. Local markets for agricultural products are both small and scattered. Because there is no dominant city as a service centre, the clay belt is serviced from outside, chiefly from the Toronto area by means of

overnight highway and railway connections. Local agricultural products, therefore, have limited selling potential. Also the costs of transporting clay belt agricultural products to outside markets are too high for the area to become competitive with other areas. Farm abandonment prevails because for labour, agriculture is in direct competition with mining and forestry.

From the above discussion, it can be seen that the pattern of socio-economic well-being in Ontario can be attributed in a large extent to the level of urbanization and industrialization, and agricultural development in the various regions. A closer look at the variables making up Component I helps to explain why this socio-economic well-being component correlates so closely in space with general economic development.

Job related earnings, including wages, salaries, professional fees and income from self-employment are the principal sources of income for most Canadian families (Bennett, 1976; 152). Average family incomes also include net income from business, professional practice, net income from farm operations and other miscellaneous sources; this is, income from practically all sources. As a result, family income levels are highly influenced by job availability. Most of the employment sources are in dominant urban centres of functional economic areas where manufacturing and service functions prevail. Commercial agriculture also plays an important role in generating income by way of cash crop production. Areas with good quality land are therefore likely to provide more employment and income opportunities in the agricultural sector. Also, with the availability of technological knowledge and with efficient management, farmers in the more industrialized districts are able to obtain high yields of several types of crops. It therefore follows that these urban areas which provide a whole

range of functions would also have higher labour participation rates as well as a high proportion of high-status jobs (white collar workers) particularly in the private and public service sectors. The high-status jobs in turn provide high incomes. High education levels (post-secondary, vocational and university) also correlate with high income levels. Many occupations in complex industrial societies have demands ranging from basic functional literacy to sophisticated intellectual skills. It must also be noted that most of those areas associated with high socio-economic well-being levels also contain major universities. Complex urban and industrial societies are also associated with relatively expensive but good quality housing. Most of the high income earners in these societies can also afford household conveniences and amenities such as colour and black and white television sets and two or more cars. These amenities in a way reflect the wealth that exists within these societies.

A close correlation therefore exists between the variables making up the socio-economic well-being component, which in turn is closely correlated with general economic development. Urban, industrial, and rich agricultural societies are therefore usually associated with high family income levels, high labour participation rates, high occupational status, high levels of educational attainment and good quality housing reflected in the housing costs and household amenities and conveniences.

In Northern Ontario the physical and human factors which prohibit agricultural development suggest that the inhabitants of the region are almost solely dependent on available mineral and forest resources for their livelihood and well-being. This is reflected in the pattern of well-being in this region where the dominant mining and forestry centres - Algoma, Sudbury

and Nipissing - perform quite well in terms of their socio-economic conditions. The rapid rates of urbanization and industrialization together with a rich and varied agriculture combine in making southwestern Ontario, in general, a prosperous region with high general socio-economic well-being levels. To the east of this prosperous zone are isolated developments in Peterborough, Frontenac, Ottawa-Carleton and Leeds, separated by rural areas. Eastern Ontario, particularly the fringe areas, the shield communities of Parry Sound, Muskoka, Victoria, Haliburton, and the regions around Lake Huron have nothing really going for them. Not only are they experiencing farm poverty but also a lagging urban and industrial development, and these account for their poor performance on the general socio-economic well-being component.

4.3.2 Social Instability

A marked feature of Map 3 is the concentration of high positive scores reflecting a high incidence of social instability throughout Northern Ontario. Southern Ontario, on the other hand, seems to have a generally low incidence of social disorganization at this scale at least. However, an interesting feature, particularly around the golden horseshoe area, is the relatively high incidence of social instability in certain districts which is associated with very high general socio-economic well-being levels - Toronto and its adjoining areas of Peel, Ontario and Dufferin. Rapidly growing areas are often associated with socially unstable populations and are subject to a certain degree of social disorganization. The instability in Toronto could be attributed to the metropolitan region's heterogeneous population. The other census divisions containing major cities, however, have a low incidence

of social instability; these include: Wentworth, Middlesex, Ottawa-Carleton, Essex, Wellington and Halton.

Another feature is the relative stability of the rural areas. These include eastern fringes of Ontario and areas in south-central Ontario (the shield districts) which were of low general socio-economic well-being. A look at Table 4.7 reveals that the rural districts of Dundas, Prescott, Prince Edward, Glengarry and Victoria have high negative values and rank amongst the lowest census divisions of this dimension. York, Brant, Oxford and Huron in the southwestern region also have socially stable populations whilst Frontenac, Bruce, Grey and Simcoe occupy intermediate positions.

4.3.3 General Unemployment

Relatively high general unemployment levels seem to be prevalent in almost every subregion of Ontario. In the southwestern region, this appears to be the case particularly in the industrial regions - the Lake St. Clair regions of Essex and Lambton, the London industrial region of Middlesex, and the Toronto, Wentworth and Niagara districts of the golden horseshoe region. This could be attributed to the large inflow of youthful migrants who move into these regions in search of urban and industrial employment without much success. It has been indicated that migrants in Ontario, as elsewhere, are chiefly in the 15-34 age group (Whebell; 1968) and that the movements are motivated primarily by people's perception of economic opportunity. Marshall (1972; 70) points out that there is a general process whereby the cities of the golden horseshoe are augmenting their populations at the expense of outlying centres characterized by out-migration. A recent study by Parson (1979) also indicates that farmers abandon their farms in

MAP 4. CENSUS DIVISION PERFORMANCE ON THE GENERAL UNEMPLOYMENT COMPONENT.

the less prosperous rural districts of the shield area and move towards the southwest in pursuit of higher urban and industrial wages. Parson points out that the Canadian shield portion of Haliburton, Hastings, Muskoka, Peterborough and Victoria counties had high proportions of owners relative to the areas south of the shield but by 1971 the situation had changed and ownership favoured the more productive areas, the areas with smaller farms, where average improved acreages were higher; that is, the area southwest of the shield. The other areas within this southwestern region, on the other hand, display low levels of unemployment. These include the rich agricultural districts of Waterloo, Perth, Oxford, Wellington, Dufferin and the Lake Erie census divisions. This is partly because it is very difficult technically for a farmer to be defined as unemployed. Also agricultural land use is not in too direct a competition with industrial and urban land use. Therefore apart from employment opportunities provided in the other sectors, there are also opportunities in the agricultural sector; whereas in the dominant manufacturing regions much of the agricultural land has been taken over for industrial and urban purposes, thereby bringing about a decline in agricultural employment.

A large proportion of the inhabitants of Northern Ontario appear to be unemployed, particularly in Algoma, Cochrane, Timiskaming, and Nipissing with Sudbury and Rainy River occupying intermediate and Kenora having low unemployment levels. The generally high unemployment levels in this region could be related to the nature of the industries. The Ontario Economic Council (1976; 3) has pointed out that forestry and the mining industry's effect on employment has been relatively less significant than the growth of output would suggest. This is because both forestry and mining are highly capital

intensive. Therefore even though output has responded positively to increases in demand, employment has in some cases declined. Also, Northern Ontario's reliance on mineral and forestry resources for an economic base makes it increasingly vulnerable in the sense that cyclical movements in demand and prices, coupled with the depletion of non-renewable resources, frequently adversely affects stability of employment. The problems associated with the agricultural sector discussed earlier, could also account for the generally high unemployment levels especially in Cochrane. The region's environmental limitations combined with its short growing season prevent farmers from establishing a commercial type of agriculture. Many of the farmers therefore operate on a part-time basis and farm abandonment prevails.

Prescott, Russell, Stormont and Glengarry in eastern Ontario also have high rates of general unemployment. It is these fringe areas of eastern Ontario and the northern Ontario districts which rank highest amongst the districts associated with general unemployment. This is not surprising since these regions - particularly eastern Ontario - are characterized by generally poor socio-economic conditions combined with a poor agricultural sector. Being a generally rural area, eastern Ontario provides very few service-oriented and industrial functions. Much of the agricultural employment here is in dairying activities - cheese production in particular. To the west of this region, extending from Prescott-Stormont to Frontenac and Renfrew, is a belt containing districts with low unemployment levels. These include Ottawa-Carleton, Dundas, Lanark, Leeds and Grenville.

Another region which reveals generally high unemployment rates lies east of Ontario - Oshawa and west of Lennox and Addington and it extends from Nipissing and Parry Sound in the north to the shore of Lake Ontario

in the south. With the exception of Durham, which has low levels, and Hastings, Prince Edward, Northumberland and Haliburton which display intermediate levels, the region has relatively high unemployment levels.

Here again, most of the districts which were associated with generally high socio-economic well-being levels have not performed too well on this dimension in terms of their employment levels. These include the prosperous industrial and urban district of southwestern Ontario - Toronto, Wentworth, Ontario, Niagara, Brant, Essex, Lambton and Middlesex; and the other districts outside the southwest region - Peterborough, Frontenac, Algoma and to a lesser extent Sudbury. On the other hand, Ottawa-Carleton, Waterloo, Wellington, Peel, Halton, York and Leeds reflect a consistent trend of generally high socio-economic well-being levels and relatively low unemployment rates; they are administrative and tertiary towns rather than industrial (primary or secondary). The eastern fringe areas of Ontario, and the Georgian Bay and Canadian shield communities, have low levels of general socio-economic well-being, and are areas characterized by high unemployment levels. The Lake Huron districts of Grey, Bruce and Huron, on the contrary, display low unemployment levels. In Bruce there is the nuclear power development which employed a work force of approximately 8,000 to 10,000 during construction.

4.3.4 Health Resource Provision

One would expect that the districts which performed well on the general socio-economic well-being dimension would also perform well under the health resource provision component and vice versa. This is almost the case when one compares the two maps (Map 2 and Map 5), although there are a few contradictions here and there.

MAP 5. CENSUS DIVISION PERFORMANCE ON THE HEALTH RESOURCE PROVISION COMPONENT.

The prosperous southwest region in general performs quite well in terms of the health resources (hospital service expenditures, OHIP payments, hospital beds, health/welfare workers, doctors) provided within the region. Middlesex, Brant, Perth, Wentworth, Toronto, Grey and Huron appear to be well-provided with health resources. Most of the other census divisions within this region occupy intermediate positions, whilst Bruce, Haldimand, Simcoe, Waterloo, Peel and Halton do not fare too well. For the latter four districts this is in contrast to their performance on Component 1. Ontario district has been excluded from consideration because data on three highly loading variables of this component (hospital service expenditures, OHIP payments, and hospital beds per 1,000 population) were not available. This accounts for the very high negative score for Ontario on this component.

To the east of Ontario-Oshawa we find a mixed picture. Not surprisingly, the areas containing Peterborough, Kingston-Frontenac and Ottawa-Carleton are well provided with health resources. Whereas Stormont, Dundas and Glengarry perform well on this health dimension, the other rural districts of Prescott and Russell do not.

The region west of Frontenac, east of Ontario and south of Muskoka-Nipissing, is one which does not seem to have been provided with a great deal by way of health resources with the exception of Hastings and Peterborough. Another interesting feature of Map 5 is the generally good performance of Northern Ontario on this health dimension. Thunder Bay, Rainy River, Parry Sound and Timiskaming emerge as outstanding districts. Due to large distances, there is a provision of centralized health services at the largest towns, which also contain a great percentage of the total population.

Sudbury and Kenora on the other hand do not fare too well on this component.

4.3.5 Mental Health and Stress

It could be hypothesized that some association exists between social instability and mental illness and stress. This may be true with regards to certain areas within this context. Kenora, Thunder Bay, Timiskaming, and Nipissing in northern Ontario, as well as Toronto and Ontario in Southern Ontario are associated with both a high incidence of social instability and a high incidence of mental illness and stress. In a similar manner, the eastern fringes of Ontario, that is, the socio-economically depressed areas of Prescott and Russell, Stormont, Dundas and Glengarry are associated with a low incidence of both social instability and mental illness and stress. The Lake St. Clair districts of Essex, Lambton and Kent, as well as York, Halton, Hamilton, Niagara, Haldimand, Norfolk, Perth, Waterloo, Brant and Wellington, all within southwestern Ontario, also have both a low incidence of social instability and mental illness and stress.

In the other districts, however, there appears to be a contrasting performance on the two components. The region west of Prescott-Dundas and east of Ontario-Oshawa, extending from the shores of Lake Ontario in the south to Sudbury and Timiskaming in the north lends credence to this view. A comparison of Map 6 and Map 3 reveals that districts with a relatively high incidence of mental illness or stress have a relatively low incidence of social instability. These districts include: Frontenac, Lanark, Leeds, Grenville, Hastings, Prince Edward, Northumberland, Peterborough, Victoria, Muskoka and Haliburton. Middlesex and Oxford in the southwest also have an

MAP 6. CENSUS DIVISION PERFORMANCE ON THE MENTAL HEALTH-STRESS COMPONENT.

incidence of mental stress and a low incidence of social instability. Areas with a low incidence of mental illness or stress and a relatively high incidence of social instability include Sudbury, Manitoulin, Algoma, Rainy River and Cochrane.

Generally Leeds, Grenville, Victoria, Prince Edward and Middlesex emerge as the highest ranking or the "worst", census divisions on the mental health-stress component, while Russell, Durham, Waterloo, Glengarry and Sudbury emerge as lowest ranking districts. Packard (1972) suggested* that the transient existence of the more mobile elements in the population predisposes them to both physical and mental illness, and fosters hedonism and other "nomadic" values. The extent to which this statement applies to the circumstances prevailing here is not really certain but it may apply to an area like Toronto where there are transient and mobile elements within the population.

4.3.6 Air Quality

Reeds (1972; 21) has pointed out that overpopulation and uncontrolled economic growth could seriously damage the physical environment in the highly industrialized areas of Southern Ontario. The highly diversified industrial regions of Toronto and Wentworth rank amongst the top three census divisions on this dimension. A huge proportion of carbon monoxide emissions in Hamilton-Wentworth is produced by cars (Ontario Statistics, 1975; 5). The industrial complexes prevalent in Toronto, Wentworth and the Niagara regions, particularly the steel mills and coke ovens, also contribute to the poor air quality in these areas.

Essex, which is just next door to - and generally downwind of - Detroit, is usually associated with high traffic volumes and this could account for

MAP 7. CENSUS DIVISION PERFORMANCE ON THE AIR QUALITY COMPONENT.

the poor air quality conditions in this district. This could also be a logical explanation for the high air pollution levels in Ottawa-Carleton which is also associated with high traffic volumes. These two districts (Essex and Ottawa-Carleton) also rank very highly on this dimension. The poor air quality conditions generally prevailing in the southwest region of Ontario could therefore be attributed to the heavily populated and industrial subdivisions within this region.

The area east of Ontario-Oshawa has generally low air pollution levels with the exception of a few districts such as Muskoka, Haliburton, Durham, Prince Edward, Dundas, Glengarry and Ottawa-Carleton. Northern Ontario with the exception of Kenora and Timiskaming has relatively fair air quality conditions.

4.3.7 Recreational Services

A prominent feature of Map 8 is the strong performance of the popular resort and tourist districts of Ontario on this dimension. These districts have a high proportion of hotels, motels and restaurants which account for a substantial amount of the net sales and receipts from service and retail trade. These resort districts include: the shield districts of Haliburton, Muskoka, Parry Sound, Victoria and Peterborough; the southwestern districts of Simcoe, Waterloo, York, Toronto and Niagara; Lanark (Smith Falls) in eastern Ontario, and Kenora, Rainy River (Fort Frances) and Sudbury in Northern Ontario.

Northern Ontario and the Georgian Bay area including the shield communities are popular resort areas. Approximately one-quarter of all Ontario residents' weekend trips are destined for the Georgian Bay area (Tourism and Outdoor Recreation Planning Committee; 1973). Georgian Bay

MAP 8. CENSUS DIVISION PERFORMANCE ON THE RECREATIONAL SERVICES COMPONENT.

and Northern Ontario were actually the two most preferred areas for an Ontario weekend trip by Ontario residents. Marshall (1972; 78) states that hotels, motels and restaurants are abundantly represented in the tourist centres of Kenora, Fort Frances (Rainy River) and Niagara all of which have a prominence of personal services. The forest areas of the north provide aesthetic landscapes; the brown podzolic soils of the Rainy River district are actually better adapted to forestry and recreational uses than agriculture (Reeds, 1972; 9). The recreation resources of the shield are an important asset to the districts within the region. The rocks and rugged country of this shield provide a very attractive scenic contrast for the city dwellers of the south. There are also the inland waters and lakes; for instance, the Simcoe lakes, the Muskoka and Kawartha lakes which have served primarily to entrench the integration of the urban fringe with the city and to expand the recreational space of the Toronto population (Simmons and Bourne, 1972; 101).

A particularly important resort district is Muskoka where the development of the recreation industry was a direct result of the forest-lake complex and its situation with respect to well-settled parts of Southern Ontario. Muskoka's greatest recreation assets are in its scenery, its land-studded lakes and wilderness. In Haliburton, the Kawartha lakes provide intervening opportunities. Commercial and private forms of recreational land use prevail in Muskoka and its surrounding district of Haliburton, Parry Sound and Simcoe. Commercial use is largely that of the resort hotel while private endeavours are involved in both summer cottages and camping (Wall, 1977; 11). Bracebridge and Gravenhurst townships in Muskoka have been characterized as neighbouring recreation centres; whilst

Kenora, Huntsville (Muskoka) and Parry Sound are described as integrated recreation areas. Areas which do not perform as well as the Georgian Bay and Northern Ontario districts on this dimension include: the subdivisions of Oxford, Perth, Norfolk, Elgin, Haldimand and Brant in southwestern Ontario where most of the land is devoted to agricultural use; and Wentworth, Wellington and Ontario. Also most of eastern Ontario does not perform too well on this dimension.

SUMMARY

Variations between census divisions with regard to seven different composite indicators of social well-being have been examined. The seven sets of component scores and ranks illustrated in Table 4.7 and the seven maps have summarized various geographical patterns of variation between the spatial units with regard to their performance on the respective components of social well-being.

The independence of the seven components is highlighted by the contrasting performance of certain districts; this is evident when a comparison of their performance on the respective dimensions is made. For instance, the rapidly growing districts associated with high general socio-economic well-being levels - high income levels, high occupational status, high proportion of populations with an extended education, relatively expensive and good quality housing and a high proportion of urban populations - did not perform so well on the other components. The strong performance of Toronto on Component I appears to have been achieved at the price of a high incidence of social instability and mental stress-induced illness, high unemployment levels and poor air quality conditions. A look at the other rapidly

growing districts within southwestern Ontario also reveals a lot of inconsistencies. Middlesex performed badly on the mental health-stress and general unemployment components; Ontario was associated with socially unstable populations, unemployment, mental illness and stress; Peel with unstable populations and a lack of health resource provision; Wentworth, Niagara and Essex with high air pollution levels and high general unemployment rates. These contradictory patterns confirm Ray's (1970) view that the forces of growth present in southwestern Ontario present a danger to the physical environment.

However, the other rapidly growing districts associated with high socio-economic well-being levels perform quite well on most of the seven components. Halton, for instance, performs badly on only the health component, Ottawa-Carleton on only the air quality component, and Waterloo on only the air quality component. York, on the other hand, is about the only district which performs well on all the seven composite indicators of social well-being.

The fringe areas of Eastern Ontario - Prescott, Russell, Stormont, and Dundas and Glengarry, also highlight some contrasting performance. These areas which are characterized by low socio-economic well-being levels on the contrary have a low incidence of social instability and mental illness or stress. However, from another point of view they show a consistent trend of low socio-economic well-being levels, high unemployment rates (except Dundas), fairly poor air quality conditions (except Stormont) and a lack of recreational services.

In Northern Ontario the prosperous mining areas of Sudbury and Algoma also show some inconsistencies as well as some consistencies. Inconsistencies are in terms of relating Component 1 on the one hand, to Components 5, 7 and 8 on the other. Kenora shows a consistent trend of low socio-economic well-being levels, socially unstable populations, mental illness and stress, a lack of health resources, and high air pollution levels. Cochrane does not seem to perform too well on all the components except for a fairly good performance on the health dimension. Thunder Bay, which occupies an intermediate level on the principal component, performs quite well on the health, recreational services and air quality components; whilst Rainy River performs well, on the contrary, on the recreational services, mental health-stress, health resources and air quality components.

4.3.8 An Index of Social Well-Being

Since most census divisions revealed contrasting performances on the independent dimensions, it would be interesting to see how these inconsistencies affected their performance on the index of social well-being. Also, by comparing the performance of the census divisions on Component 1 to their performance on the index of social well-being it would be interesting to find out whether the weighting of the variables affected the ordering of these districts. This index was arrived at simply by summing up the scores for each census division over all components. The scores were weighted in the summation in accordance with the component's relative share of the explained variance. The summed scores were then mapped by quintile divisions.

MAP 9. CENSUS DIVISION PERFORMANCE ON THE INDEX OF SOCIAL WELL-BEING.

A fairly distinctive pattern of regional differentiation emerges from the summation of scores on the wide range of variables. The southwestern region with its numerous urban, industrial and rich agricultural districts emerges with the highest index scores. The Lake St. Clair region of Essex, Lambton and Kent emerges with relatively high levels and the Lake Erie districts of Elgin, Norfolk and Haldimand, which are essentially tobacco-producing areas, emerge with intermediate levels. The predominantly industrial regions of Toronto, Wentworth and Niagara in the golden horseshoe area come out with relatively high levels, as do Brant and Oxford within the agricultural heartland region, and Simcoe and Dufferin. The districts with very high levels of social well-being include Halton, Peel, York, Ontario, Waterloo, and Middlesex. To the north of this southwestern region - the Huron upland and the Bruce Peninsula - are the generally low social well-being districts of Bruce, Grey and Huron.

The region east of Ontario-Oshawa and Muskoka is characterized by pockets of very high social well-being districts which include Peterborough, Frontenac and Ottawa-Carleton. Durham, Hastings-Trenton, Lanark and Leeds occupy intermediate positions. The predominantly rural areas of eastern Ontario which rely on dairying and small businesses, are characterized by generally low levels of social well-being; these include Prescott, Russell, Stormont, Dundas, Glengarry and Grenville. Other districts which do not come out strongly on the index are: Renfrew, Lennox and Addington, Prince Edward, Northumberland, Victoria and Haliburton.

The region north of the Muskoka, Haliburton, Hastings and Renfrew belt - Northern Ontario - also has generally low social well-being levels, particularly within Nipissing, Parry Sound, Manitoulin, Rainy River, Kenora,

Cochrane and Timiskaming. The major mining centres of Sudbury and Algoma in northeastern Ontario and the district of Thundray Bay which has been described as a leading urban centre in northwestern Ontario (Ontario Economic Council; 1976), come out fairly strongly.

This geographical pattern, like the pattern revealed on Component 1, tends to reflect a broad set of social well-being characteristics related to the urban-rural dichotomy. There does not seem to be much of a difference between the broad regional patterns of Map 2 and Map 9; in this regard, the weighting of variables appears to have had a minimal effect. However, when the ranks of census divisions on Component 1 are compared with their ranks on the index of social well-being, the weighting of the variables does seem to have had some effect on the ordering of the districts. Toronto, for instance, has a significant change in rank from fifth on Component 1 to sixteenth on the index; thus signifying the effect of its poor performance on Components 2, 3, 5, and 7. Most of the other districts which were affected significantly in a negative manner are the districts in northern Ontario: Algoma (17 on Component 1 and 32 on the index), Cochrane (36 to 52), Nipissing (21 to 38) and Kenora (39 to 54). Districts showing a significant change in the positive direction include Perth (33 to 12), Dundas (50 to 36), Muskoka (43 to 31), and Lanark (38 to 22). On the other hand, there are those districts which were affected very little by the weighting. Some of these include: York, Waterloo, Halton, Wentworth, Niagara, Ottawa-Carleton, Peterborough, Middlesex, Sudbury, Thunder Bay, Victoria, Parry Sound, Frontenac, Timiskaming, the fringe areas of eastern Ontario, Prince Edward, Northumberland, Simcoe, Bruce, Grey, Huron and Rainy River.

The social well-being index to some extent summarizes inter-district variations on the different dimensions of social well-being revealed by the principal components analysis. Although in a number of cases, the weighting of the variables was found to affect the ordering and patterning of the districts very little, the index served as a useful supplement to the other seven dimensions of social well-being. The geographical pattern of variations between the census divisions on the social well-being index confirms the view that areas associated with high degrees of urbanization, industrialization and agricultural development are characterized by high social well-being levels. This feature is not only evident in Western-advanced economies as has been demonstrated here, and also demonstrated in Smith's (1973) study of inter-state variations within the U.S., and Knox's (1975) study of levels of living in England and Wales, but is also evident in the Eastern socialist states which share an ideological commitment to the elimination of major disparities in economic and social well-being. Fuchs and Demko (1979, 308) point out that to a considerable degree the regional disparities in countries like Russia, East Germany, Czechoslovakia, Poland and Hungary reflect regional differences in the degree of urbanization, industrialization and the resulting territorial differentiation of occupational structure. Because income and consumption levels of urban residents are generally higher than those of rural workers, the more urbanized and industrial areas which are also provided with better public and service facilities, rank higher on measures of economic and social well-being.

4.4 COMPARISON WITH OTHER STUDIES

One other analysis of inter-district variations that is somewhat comparable to that attempted here is a study by Berry (1965) which explores the dimensionality of rural poverty on the basis of 555 municipalities in Ontario. Forty-seven variables were originally selected for the study and these were based mainly on data relating to income - farm incomes and non-farm incomes. There were very few variables relating to educational attainment and household services, and a single variable relating to health - the infant mortality rate.

Berry conducted a factor analysis leading ultimately to four factors (on the basis of 20 percentage-type variables). Factor one revealed 'rural type poverty' where the proportion of farm operatives with low incomes was greatest and average incomes of farm operatives lowest. There were also low levels of household services. Factor two pointed out relative 'rural non-farm poverty' associating greater proportions of low income rural non-farm residents with low levels of educational attainment and low levels of household services. The third factor related to rural non-farm incomes but could not be clearly interpreted and was therefore dropped from the analysis. Finally, the fourth factor pointed out areas of relative social disadvantage in which low educational attainment and high infant mortality rates were highly correlated. Factor scores for each of the 555 municipalities are presented in Appendix D.

How close were Berry's results to those of the final analysis? Of the three factors for which Berry produced municipality scores, Factor 2 (rural non-farm poverty) is about the most relevant to this study but only with respect to Component 1. Berry's rural non-farm poverty dimension consisted of variables such as: the percentage of non-farm residents with incomes of less than \$3,000, percentage of non-farm residents with incomes of less

than \$2,000, percentage of population reporting cold and hot running water, percentage of population reporting toilets, percentage of population reporting university degree, percentage reporting 8th grade or less education and the ratio of value of machinery and livestock to land and buildings. Factors 1 and 4, on the other hand, have relatively less comparative relevance to this study, as factor one reveals mainly rural farm poverty. However, with respect to Factor 4 (social disadvantage), the variables relating to low educational levels - per cent reporting 4th grade or less education, percent reporting less than 8th grade or less education - appear to be relevant (only to Component 1), whilst the single variable of infant mortality has no direct equivalent in this study. Nevertheless, in characterizing Berry's first two factors as factors identifying economic disadvantaged-regions and the third as a factor identifying socially disadvantaged regions, some comparison can be made with regard to all the three factors on the one hand and Component 1 on the other.

Because of the cartographic work involved, Berry mapped only the southwestern and eastern municipalities and excluded the northerly cases. Therefore in order to make any comparison relating to Northern Ontario, it will be necessary to refer to Appendix D which lists Berry's factor scores, and Table 4.7 of this study.

Berry found that the pattern of economic disadvantage relating to rural non-farm poverty (Factor 2) was at its most intense in the areas which were least integrated into the hierarchy of Ontario's functional economic areas. These areas were located along the divides which separate zones of urban influence or zones of population increase. The high positive scores on this factor, indicating prosperity, embraced all municipalities containing the larger urban places, whereas the zones associated with relative rural non-farm

poverty were the zones of inter-urban peripheries or zones of greatest population decline. Evidently Barry's rural non-farm poverty was related to the spatial organization of activities around the higher-order marketing centres or the upper levels of the central place system. These findings are, of course, similar to the findings of this study which shows that subdivisions associated with high socio-economic well-being levels are those subdivisions containing major urban places. The prosperous areas each centring upon an urban area of some size or representing the coalescence of zones focusing upon several urban centres, according to Berry's findings, were concentrated in the urban municipalities of southwestern Ontario and extended in a loop around the edges of Algonquin Park in Eastern Ontario to include Carleton, Leeds, Hastings and Prescott. This pattern is quite similar (Prescott being an exception) to the pattern on Map 2 in this study.

The relatively urbanized districts of Sudbury and Thunder Bay in Northern Ontario appear to have quite a large number of municipalities with positive scores on Berry's Factor 2 (Appendix D), and Algoma seems to have a mixture of both negative and positive scores. This pattern seems to be consistent with the performance of these three northern districts on the general socio-economic well-being component. Rainy River and Timiskaming both with large numbers of negative scores also appear to be consistent. On the other hand, Cochrane displays some inconsistency, all its municipalities have positive scores, whereas in this study it does not perform too well on Component 1.

With regard to Factor 1 (rural farm poverty) which also reflects economically disadvantaged areas, Berry found that relative farm poverty was greater in Eastern Ontario than in the southwestern region. He found a clear

zone of rural poverty sweeping Eastern Ontario along the Frontenac axis. Such a zone includes the counties of Frontenac, Lennox, Haliburton, Renfrew, Nipissing and Parry Sound. Brant, Waterloo and Essex, the cash cropping areas in the southwest on the other hand emerged as prosperous farm regions. Areas in Northern Ontario identified with rural farm poverty or areas which had a lot of municipalities with positive scores were: Algonquin, Manitoulin and Rainy River. Apart from Frontenac in Southern Ontario and Algonquin, Timiskaming, Nipissing, Kenora and Cochrane in Northern Ontario, these findings can be closely linked to the findings regarding Component 1 in this study.

Another finding stressed by Berry was the identification of the easternmost "tip" of Ontario involving Glengarry, Prescott, Russell and Stormont as a subregion of social disadvantage. Berry regarded social disadvantage as a cultural phenomenon relating to differences in the background, standards and aspirations of population groups and therefore associated social deprivation in this sub-region with the French Canadians. Perhaps in relation to the variables used to measure social deprivation (educational attainment and infant mortality), Berry might be justified in his characterization of the tip of Eastern Ontario as a socially disadvantaged sub-region. However, the interesting factor here is that whereas this sub-region was associated with social disadvantage in Berry's study, it has in this present study been found to be a region with low incidences of social instability, mental illness and stress. Most of the municipalities in Northern Ontario, on the other hand, had positive scores indicating high levels of educational attainment and low infant mortality rates (Appendix D). Examples of districts containing these municipalities include: Timiskaming, Sudbury, Rainy River, Thunder Bay, Nipissing, Cochrane and Kenora. Here again, ironically enough it is this very region which displayed a high incidence of social instability in this present study.

CHAPTER 5

SUMMARY AND CONCLUSIONS

This study has attempted to determine and describe spatial variations in social well-being within Ontario. Various patterns relating to the measurement of social well-being which can be traced to problems associated with the general development of social indicators have been discussed, as have problems relating to data compilation. Some of the concepts and techniques so far developed in establishing social indicators, as well as suggestions relating to the improvement of social reporting and accounting have also been discussed. It is quite clear that there is not yet an adequate system of social indicators, social accounts or social reports dealing with the conceptualization of social well-being nor is there agreement on an approach to its measurement.

While recognizing the limitations imposed by the conceptual, technical and methodological difficulties and the shortage of data on many important social conditions (particularly "output" measures) - problems which have accounted for most of the discrepancies between conceptual abstractions of well-being and the variables representing them - an attempt has been made to operationally define social well-being, using Smith's criteria as a major guideline, and to portray its spatial expression within Ontario. What is important here is that, despite diversity of opinion of what might constitute useful social indicators, there is some commonly accepted conceptual basis from which operational social indicators can be developed. As Smith (1973) pointed out, the present state of knowledge should not constrain us too much in developing social indicators. By including a range of alternative measures

of the same general concept or condition, it should be possible to capture most of what really matters, even if it is not possible at present to define precisely what really matters. Gross (1966) has pointed out that one can never measure the variables that are of major interest directly, but one must select surrogates that stand in place of such variables.

Another limitation of the study is its descriptive nature. This is of course implicit in the use of a principal component analysis. As Vincent (1971; 9) points out, it should be clear from the outset that regardless of method the primary value of factor analytic techniques is as descriptive and/or data reduction methods, and there exists a clear distinction between the identification of causes and the description of variables in terms of factors. Kerr (1965; 70) also notes that factor analysis is a very important tool in identifying characteristics of local areas and depicting broad patterns, but it is simply a prerequisite for explanatory analysis and not a part of explanation *per se*. It is because of this latter constraint that some verbal explanation was attempted, in which patterns of well-being were linked to regional variations in the division of labour, and economic specialization.

Having said this, the principal components analysis must be regarded as successful in reducing the large set of available data to seven composite territorial indicators representing over two-thirds of the total variation in the data, and in expressing some dimensions of social well-being and their regional differentiation. In a spatial framework, the territorial composite indicators developed portray important dimensions of the social system, revealing the extent to which groups of people in different geographic areas have different experiences with respect to the different conditions and levels of

opportunity that have a bearing on their well-being; to this extent, they describe the regional patterning of life chances. The territorial indicators also show that levels of general socio-economic well-being, social stability, general unemployment, health resource provision, mental health and stress, air quality and recreational services are subject to considerable variations between the subdivisions.

One general conclusion emerges quite clearly from the analysis; that is, the existence of a principal component relating to general socio-economic conditions in Ontario. A cursory glance at the pattern of socio-economic well-being confirms some of the fundamental patterns in the geography of Ontario such as the prosperity of the highly urbanized southwestern region. More important has been the discovery of socio-economically depressed areas and also the identification of "pockets of prosperity" in poor areas as in the region east of Oshawa-Ontario. Perhaps what is even more important is the distinct and independent nature of the seven dimensions produced by the analysis. The independence of the different dimensions has been highlighted by the contrasting performances of specific census divisions which fared well on a few components, and poorly on others. A good example is the dominant, prosperous and much talked about metropolitan district of Toronto which performed very well on the principal component, the recreational service and health components, and poorly on the other components.

The inconsistencies and contradictions displayed by various districts prompted the construction of an index of social well-being based on the summation of weighted component scores. Although it may be argued that the significant variations in the contribution of the individual components are

masked by the generality of the index, its construction was found to be a useful supplement to the other dimensions. It was useful in the sense that in comparing the rankings of specific districts on the index with their rankings on the principal component, some changes were detected. These changes were, of course, the result of the districts' contrasting performances on the different dimensions.

Another significant finding was the close spatial correlation between the level of socio-economic well-being in various districts and their levels of urbanization, industrialization and to a lesser extent, agricultural development. Applying the concepts of social well-being and level of living, Smith (1973) and Knox (1975) have also shown that there are extreme inequalities closely correlated to levels of general economic development in the United States and England respectively. A similar characteristic has also been found in the Eastern Socialist States (Demko and Fuchs; 1979).

This issue of well-being inequalities raises the question of whether inequalities observed in spatial patterns are just or unjust. This of course is difficult to determine since the question of what comprises a just spatial distribution is too complex to be fully explored here. Harvey (1972) has examined the idea of territorial distributive justice in detail, pointing out that the justness of a given distribution depends on the criterion of distributive justice to be applied: equality, need, achievement and so on. Smith (1972), has pointed out that if contribution to society (as measured by market-place return for labour) is the sole criterion through which society distributes its benefits, then extreme variations in social well-being within regions may be socially just if they broadly reflect income levels. But if the criterion of need is adopted instead, then the existing situation

would obviously be grossly unjust. Therefore by the criterion of need, the lack of health resources or facilities in some places in Ontario is clearly unjust, as is the shortage of general employment opportunities, and the existence of substandard dwellings. Smith (1973; 6) adds that:

"ultimately, any geographical pattern that reflects a distribution arrived at in a way that contravenes a society's generally accepted moral principles would be regarded *prima facie* as unjust."

This is where the greatest significance of the territorial indicators comes in; for they show how populations in particular areas are differentiated from one another with respect to their average conditions of life. Insofar as the access to "the material good life" varies from place-to-place, a form of territorial discrimination may be said to exist as real as discrimination by race, colour or creed. Smith (1973) points out since we do not expect to discriminate against people on the basis of race, religion, colour or social class, neither should we necessarily discriminate against people on the basis of area of residence or by virtue of their location. Composite territorial indicators therefore not only reveal local variations, but also assist in the identification of problem areas and help in specifying the particular social conditions of concern.

This study has been largely exploratory in nature and has only been able to present some general ideas and findings. But with an improved series of social statistics and more fully defined measures of the concept, social well-being could well provide the conceptual framework for the close monitoring of the social geography of Ontario. An alternative to studies associated with inadequate and incomplete secondary data on social indicators is the conducting of primary or attitudinal surveys more conveniently at the micro-level, the starting point being the individual member of the society.

The University of Michigan Institute for Social Research and the Berkeley Survey Research Center, are heavily engaged in developing measures of the quality of life or well-being as perceived by individuals. Andrews (1973) points out that perceptual indicators play an important and complementary role to the non-perceptual indicators: A person has a certain degree of satisfaction or dissatisfaction with some aspect of his life. Part of what is relevant is the actual state of his world - his house has a certain number of rooms, the roof is of a certain quality, and the plumbing facilities are inadequate - but also relevant are a person's aspirations and expectations. Both the actual state of the world and people's expectations change over time. It is quite possible that while non-perceptual well-being may be improving (housing may be better), people are becoming less satisfied perhaps because their aspirations in life rise faster than the actual improvement of its quality.

What is important here is that if one wants to measure social well-being, it must be done directly. One might set out to measure people's satisfactions with their food, health, housing, family life, jobs, incomes, 'personal accomplishments, neighbourhoods, available public and private services and many more. To take measurement on social well-being conceived in this way would obviously involve large-scale survey research as well as skills and resources. The skills required will include expertise at sampling, questionnaire construction, field interviewing, survey data analysis, and management of the services and staff which support such activities. Nevertheless, social indicators, including perceptual measures of social well-being "seem destined to fill the gap" (Andrews; 1973) and they also have a potential usefulness especially at a more manageable level - the intra-district or intra-city level.

APPENDIX A

TECHNICAL APPENDIX: CONCEPTS AND DEFINITIONS

1. WELFARE AND SOCIAL SECURITY(i) General Welfare Assistance

The General Welfare Assistance Act provides for cost sharing of social assistance that is administered to individuals and families in need by the municipal governments. Under this Act General Assistance is the main income maintenance program for people who are in short term emergency need.

(ii) Family Benefits

The Family Benefits Act provides for people who are likely to need social assistance for a longer term. They include the disabled and families where the father is absent or disabled. This program is administered by the Ministry. Other cases involved include blind cases, unemployable cases, mothers and children.

(iii) Child Welfare

The Child Welfare Act is administered by the Children's Aid Societies with funds from the provincial and municipal governments. Generally each society serves one or more counties or districts. Beneficiaries are defined as total number of children receiving protection and preventive services. And all types of cases are as follows: children in care cases, services to unmarried parents cases, private adoption society supervised cases.

(iv) Social Service Expenditure/Capita

Social service expenditures by federal, provincial, municipal governments and other agencies include: family benefit allowances, general welfare assistance allowance, homes for the aged, child welfare and the rest going to a variety of social services.

2. HOUSING

(i) Occupied Dwelling - refers to a private dwelling occupied by a person or persons on Census Day, or whose usual occupants were temporarily residing elsewhere.

(ii) A dwelling refers to a structurally separate set of living quarters with a private entrance from outside or from a common hallway or stairway inside the building.

- (iii) Owned - refers to a dwelling which is owned by some members of the household. This includes dwellings under separate ownership in any multiple dwelling structure. A dwelling is classified as owned even though it may be mortgaged.
- (iv) Cash Rent - Figures for 'cash rent' relate to tenant-occupied non-farm dwellings and are based on the dollar amount required to secure occupancy, but not the ownership, of a dwelling for either the week or month prior to enumeration day. Averages have been determined on the basis of stated rent, excluding cases in which no cash rent was paid.
- (v) Value - figures for "dwelling value" are based on the amount expected by the owner if the dwelling were to be sold to a willing buyer. Dwelling values include the value of the land on which the dwelling is situated and of any other structure on the property such as a garage or shed. The values are for single, detached, owner-occupied, non-farm dwellings.
- (vi) Rooms - refers to an enclosed area within a dwelling which is finished and suitable for year-round living. Not counted as rooms are bathrooms, clothes, pantries, halls and rooms solely used for business purposes.
- (vii) Bath Facilities - refers to installed bath and shower facilities connected to a drain using piped running water and controlled by a tap.
- (viii) Television - refers to both portable, console and combination models powered by either battery or regular electrical sources and belonging to any member of the household including relatives and lodgers.
- (ix) Automobiles - refers to passenger vehicles for personal use by any member of the household, belonging to any member of the household, including relatives and lodgers. Trucks, vehicles out of permanent working order and company cars used entirely for business are not included.
- (x) Crowded - refers to households that have more than one person per room.

3. HEALTH

- (i) Crude birth rate - includes live births and stillbirths.
- (ii) Infant mortality rate - includes infants under one year of age.
- (iii) Wolfson's Hospital Health Index - Used by Wolfson to rank the seriousness of ill-health associated (by doctors) with a set of 59 disease categories. The index is dependent upon patients being processed by the health care system. It does not pick up untreated illness or illness where no consultation takes place with a physician. High values of the index indicate a worse community health status.

(iv) Deaths resulting from disease of the circulatory system

Diseases here are related to: Active rheumatic fever, chronic rheumatic heart disease, hypertensive disease and other forms of heart disease, as well as disease of the arteries, arterioles and capillaries.

(v) Deaths from all malignant neoplasms

Includes diseases related to the buccal cavity and pharynx, oesophagus, stomach, intestine, rectum, larynx, trachea, bronchus and lung, bone, skin, breast, uterus, digestive organs, urinary organs, leukemia, benign neoplasms and Hodgkin's disease.

(vi) Deaths from disease of the respiratory system

Includes - acute respiratory infection, influenza, viral pneumonia, bronchitis, emphysema, asthma, empyema and lung abscess.

4. POPULATION(i) Sex Ratio - proportion of males to 100 females.(ii) Dependency Ratio - used to measure the impact of age composition on the livelihood activity of the population. It purports to measure how many dependents each 100 persons in the productive years must support. The ratio can be computed in parts, one part measuring the dependency load of youth (child dependency ratio) and the other part, the dependency load of the aged (aged dependency ratio).(iii) Urban - includes the population living in (a) incorporated cities, towns and villages with a population of 1,000 or over; (b) unincorporated places of 1,000 or over having a population density of at least 1,000 per square mile; (c) the built-up fringes of (a) and (b) having a minimum population of 1,000 and a density of at least 1,000 per square mile.(iv) Population Growth Index - Population growth index for 1966-1971 is as follows:

$$\frac{\text{Population in 1971} - \text{Population in 1966}}{(\text{Population in 1971} + \text{Population in 1966})/2} \times 100$$

(v) Average Family Size - the average number of persons per family. A family consists of a husband and wife, with or without children who have never been married (regardless of age) or of a parent with one or more children never married, living in the same dwelling. A family may consist also of a man or woman living with a guardianship child or ward under 21 years for whom no pay is received.

5. ETHNICITY

- (1) The ethnic diversity index is a composite measure based on the proportion of a census tract's population in each of 12 ethnic groups, that allows the evaluation of the degree of diversity of the population of a neighbourhood according to ethnic origin. The formula is as follows:

$$\text{Ethnic diversity index} = 1 - \sum P_i^2$$

Where P_i = the proportion of a census tract's population in the i^{th} ethnic group.

One first calculates the proportion of the tract's population in each ethnic group, squares each of these proportions, then sums these squares and subtracts the total from 1. The index has a possible range from 0 to 0.92; an index of 0 would indicate that all the population has the same ethnic origin (an ethnically homogeneous census tract). An index of 0.92 would indicate that the population has a large number of ethnic groups or an ethnically diverse census tract.

6. INCOME AND WEALTH

- (i) Average Family Income - Includes the incomes received by all members of the family 15 years old and over, from all sources during the calendar year 1970. Included are wages and salaries, net income from business and professional practice, net income from farm operations, transfer payments, retirement pensions, investment income and other miscellaneous sources.
- (ii) Service Trade - refers to the operation of establishments in the service trades sector: data aggregated to reflect the activities of "business locations". The kind of service establishments are related to amusement and recreation services, services to business management, personal services, accommodation and food services and miscellaneous services (photographers, automobile rentals, repair shops, etc.).
- (iii) Retail Trade - the retail kind of business was arranged into six major groups as follows: food stores, general merchandise stores, automotive stores or shops, apparel and accessories stores, hardware and home furnishing stores and other retail stores (pharmacies, florists, jewellers, etc.)

7. SOCIAL DISORDER

- (i) Juvenile Delinquent - A juvenile delinquent as defined in the Juvenile Delinquents Act means any child who violates any provision of the Criminal Code or of any Dominion or Provincial Statute, or any By-Law or Ordinance of any municipality, or who is guilty of sexual immorality or any similar form of vice, or who is liable by reason of any other act to be committed to an industrial school or juvenile reformatory

under the provision of any Dominion or Provincial Statute. The commission by a child of any of these acts constitutes an offence to be known as delinquency. The upper age limit of children brought before the Juvenile Court in provinces varies. The Juvenile Delinquents Act defines a child as meaning any boy or girl apparently or actually under the age of 16 or such other age as directed in any province. In Ontario the age limit is 16.

- (ii) Indictable Offence - It is regarded as an offence not only against a person but against the whole state. These offences are designated by statute, which also defines maximum punishment in each case; they demand a more formal hearing than ordinary offences.

Indictable offences are usually classified for statistical purposes as:

- (1) Criminal code offences such as: against the person (abduction, kidnapping, assaults, criminal negligence, incest, rape, libel, murder); against property, with violence (breaking and entering, robbery, extortion); malicious offences against property (arson, other malicious damages to property); forgery and offences against currency.
- (2) Federal Statutes such as offences against the Customs Act, Excise Act, Food and Drug Act, Narcotic Control Act, and Post Office Act.

8. EMPLOYMENT

- (i) Labour Force - refers to all those persons reported to have either worked (employed) or looked for work (unemployed) during the reference week for pay or profit.
- (ii) Participation Rate - The percentage the labour force forms of the population 15 years and over in the category or area.
- (iii) Unemployed Labour Force

The unemployed consists of all non-inmates 15 years and over, who, during the week prior to enumeration, were not working but were looking for work, or were on temporary lay-off or would have been looking for work except that they were temporarily ill, or believed no suitable work was available in the community.

- (iv) White Collar Workers - White collar workers include the following occupations:

- Group 11: Managerial, administrative and related fields
- Group 21: Natural sciences, engineering and mathematics
- Group 23: Social sciences and related fields
- Group 25: Religion
- Group 27: Teaching and related fields
- Group 31: Media and health
- Group 33: Artistic, literary, recreational and related fields
- Group 41: Clerical and related fields
- Group 51: Sales.

9. EDUCATION

- (1) Level of Schooling - refers to the highest grade or year of elementary school, secondary school or university ever attended and for some levels whether or not post-secondary education was reported or not. Individuals may have completed vocational training, either apprenticeship or other full-time courses, in addition to the schooling shown. The three levels presented in this study are:
- (a) Elementary: Grades 1-8 (including no schooling).
 - (b) Post-secondary, non-university and vocational: Grades 9 to 13.
 - (c) University degree: Includes university certificates, diplomas, and degrees at all levels.

10. ENVIRONMENTAL QUALITY

- (i) Suspended Particulates - Suspended particulates is a general term applied to a wide variety of solid or liquid particles of a size and configuration such that they tend to remain suspended in the air and can thus be drawn into the respiratory passages. Particulate material is the most commonly perceived form of air contamination, often manifesting itself by interference with visibility, by its soiling effect on materials, or as a respiratory irritant.
- Forest fires, iron ore mining and beneficiation, asbestos production, power generation by utilities, stone quarrying and processing, and cement manufacturing are major sources of suspended particulates.
- (ii) Sulphur Dioxide - is a colourless gas and normally is not present in urban air at concentrations high enough for its odour to be detected. It is emitted into the atmosphere mainly from the production of primary copper and nickel, from natural gas processing, and from the combustion of sulphur containing fuels.
- (iii) Nitrogen Oxide - is formed when fuels are combusted at high temperatures in engines and furnaces; therefore an important source of NO_2 is the gasoline-powered motor vehicle. Other sources include diesel (internal combustion) engines, power generation by utilities, and industrial fuel combustion.
- (iv) Carbon Monoxide - Carbon monoxide is produced by the incomplete combustion of any organic fuel. The primary source of CO emissions is the gasoline-powered motor vehicle. Other important sources include forest fires, the non-highway use of gasoline, the petroleum refining process and wigwam burners.

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APPENDIX B: GRAPHICAL PRESENTATION OF COMPONENTS

HORIZONTAL FACTOR 1	VERTICAL FACTOR 3	
58	57	1 - SOCIAL
		3 - FARMEN
		5 - CHILDEXP
		7 - TV
		9 - NOBATH
		11 - CROWDED
		13 - VALUERE
		15 - HOOMAVE
		17 - IMR
		19 - TB
		21 - DOCTOR
		23 - DRGIRC
		25 - DRRESP
		27 - SPECIST
		29 - HOSPEXP
		31 - SEXR
		33 - AGEUEP
		35 - POPINDEX
		37 - ETHNIC
		39 - INCOME15
		41 - RETAIL
		43 - HEALWELF
		45 - CINEMA
		47 - FOOD
		49 - SUICIDE
		51 - CDR
		53 - DOPE
		55 - JUVENILE
		57 - UNEMPLOY
		59 - WHITE
		61 - POSTSEC
		63 - PTATID
		65 - SUSPARI
		67 - MC2
		2 - WELFARE
		4 - AUEEXP
		6 - AUTOCAR
		8 - CULDH20
		10 - YEARS30
		12 - OWNER
		14 - RENT
		16 - BR
		18 - GDR
		20 - GENTIST
		22 - PSYCH
		24 - ORALIG
		26 - WULFSON
		28 - HOSPBED
		30 - CHIP
		32 - CHILDEXP
		34 - UNBAY
		36 - FAMSIZ
		38 - IYCOEF
		40 - INCOME5
		42 - SERVICE
		44 - LIBRARY
		46 - HOTEL
		48 - ARTLIT
		50 - ILLEBORN
		52 - CRIME
		54 - LAW
		56 - PARTRATE
		58 - MALEUR
		60 - DEGREE
		62 - ELEMENT
		64 - VJTER
		66 - SIZ2
		68 - CIZ2

HORIZONTAL FACTOR 1 VERTICAL FACTOR 5

1 - SOCIAL	2 - WELFARE
3 - FAREEN	4 - AGEEXP
5 - CHILDEXP	6 - AUTOCAR
7 - TV	8 - COLDH20
9 - NOBATH	10 - YEARS30
11 - CROKDED	12 - OYER8
13 - VALUEHSE	14 - REVT
15 - ROOMHVE	16 - BR
17 - IMR	18 - QDR
19 - TB	20 - DENTIST
21 - DOCTOR	22 - PSYCH
23 - DRCLIC	24 - DYMALIO
25 - DRRESP	26 - WOLFSON
27 - SPECIST	28 - HOSPBED
29 - HOSPEXP	30 - ONIP
31 - SEXR	32 - CHILDEXP
33 - AGEDEP	34 - URBAN
35 - POPINDEX	36 - FAMSIZE
37 - ETHNIC	38 - INCOME
39 - INCOME15	40 - INCOMES
41 - RETAIL	42 - SERVICE
43 - HEALTHELF	44 - LIBRARY
45 - CINEMA	46 - MUSEL
47 - FOOD	48 - ACTLIT
49 - SUICIDE	50 - ILLEBORN
51 - COH	52 - CRIME
53 - DOP	54 - LAM
55 - JUVENILE	56 - PARTRATE
57 - UNEMPLOY	58 - MALEUR
59 - WHITE	60 - DEGREE
61 - POSTSEC	62 - ELEMENT
63 - PTRAIO	64 - VOTER
65 - SUPPART	66 - SUE
67 - NO2	68 - C02

HORIZONTAL FACTOR 1 VERTICAL FACTOR 7

1 - SOCIAL	2 - WELFARE
3 - FARMEN	4 - ALEXEP
5 - CHILDEXP	6 - AUTOCAR
7 - TV	8 - CULOM20
9 - NOBATH	10 - YEAR830
11 - CROUDED	12 - OWNERS
13 - VALUERE	14 - RENT
15 - ROOMAVE	16 - BR
17 - INR	18 - GUR
19 - TB	20 - DENTIM
21 - DOCTOR	22 - PSYCH
23 - DRICRC	24 - DMALIO
25 - DRRESP	26 - WLFSDN
27 - SPECIST	28 - HUSPBD
29 - MOSREXP	30 - UNIP
31 - SEXR	32 - CHILDEXP
33 - AGEDP	34 - URGAY
35 - POPINDEX	36 - FANSIZE
37 - ETHNIC	38 - INCOME
39 - INCOME15	40 - INCOMES
41 - RETAIL	42 - SERVICE
43 - HEALTH	44 - LIBRARY
45 - CINEMA	46 - HOTEL
47 - FOOD	48 - ANTLIT
49 - SUICIDE	50 - ILLEBORN
51 - COR	52 - CRIME
53 - DOPE	54 - LAY
55 - JUVENILE	56 - PATRATE
57 - UNEMPLOY	58 - MALEUR
59 - WHITE	60 - UEGREE
61 - POSTSEC	62 - ELEMINT
63 - PTRATIO	64 - VJTER
65 - SUSPART	66 - S02
67 - NO2	68 - CO2

12 36 32

40 3310 4550 4758 5266 53 20 3 7 61

62 23 3 21 11 422 556 1543 26 16 35

24 63 49 19 29 52 53 41 30 48 60 13 3914 38

1 28 2 65 37 542 44 51 48 60 13 3914 38

3310 4550 4758 5266 53 20 3 7 61

62 23 3 21 11 422 556 1543 26 16 35

HORIZONTAL FACTOR 1 VERTICAL FACTOR 8

47	4241	54	35	61	14	1 - SOCIAL	2 - WELFARE
47	4241	54	35	61	14	3 - FAMEN	4 - ASSEXP
47	4241	54	35	61	14	5 - CHILDEXP	6 - AUTOCAR
47	4241	54	35	61	14	7 - TV	8 - CULDM20
47	4241	54	35	61	14	9 - NOBATH	10 - YEARS30
47	4241	54	35	61	14	11 - CROWDED	12 - O-NERS
47	4241	54	35	61	14	13 - VALUEN8E	14 - RENT
47	4241	54	35	61	14	15 - ROOMAVE	16 - BK
47	4241	54	35	61	14	17 - IMR	18 - GDR
47	4241	54	35	61	14	19 - TB	20 - DENTIST
47	4241	54	35	61	14	21 - DOCTOR	22 - PSYCH
47	4241	54	35	61	14	23 - DRCLIC	24 - DNTALIG
47	4241	54	35	61	14	25 - DRRESP	26 - MULF80N
47	4241	54	35	61	14	27 - SPECIST	28 - MOSP8ED
47	4241	54	35	61	14	29 - HOSPEXP	30 - OATP
47	4241	54	35	61	14	31 - SEXH	42 - CHILDOEP
47	4241	54	35	61	14	33 - AGEDEP	34 - URGAY
47	4241	54	35	61	14	35 - POPINDEX	36 - FASIZE
47	4241	54	35	61	14	37 - ETHNIC	38 - IYCOMEF
47	4241	54	35	61	14	39 - INCOME15	40 - IYCOMES
47	4241	54	35	61	14	41 - RETAIL	42 - SERVICE
47	4241	54	35	61	14	43 - HEALWELF	44 - LIBRARY
47	4241	54	35	61	14	45 - CINEMA	46 - MOEL
47	4241	54	35	61	14	47 - FOOD	48 - ARTLIT
47	4241	54	35	61	14	49 - SUICIDE	50 - ILLEBORN
47	4241	54	35	61	14	51 - COH	52 - CRIME
47	4241	54	35	61	14	53 - DOPE	54 - LAW
47	4241	54	35	61	14	55 - JUVENILE	56 - PATRATE
47	4241	54	35	61	14	57 - UNEMPLOY	58 - MALEUR
47	4241	54	35	61	14	59 - WHITE	60 - OSGREG
47	4241	54	35	61	14	61 - POSTSEC	62 - ELEMENT
47	4241	54	35	61	14	63 - PTATID	64 - VOTER
47	4241	54	35	61	14	65 - SUSPART	66 - SGE
47	4241	54	35	61	14	67 - NO2	68 - CO2

HORIZONTAL FACTOR 2 VERTICAL FACTOR 4

1 - SOCIAL	2 - WELFARE
3 - FARMEN	4 - AGEEXP
5 - CHILDEXP	6 - AUTOCAR
7 - TV	8 - COLDH2O
9 - NOBATH	10 - YEAR830
11 - CROWDED	12 - OWNERS
13 - VALUEHSE	14 - RENT
15 - ROOMMATE	16 - BR
17 - IMR	18 - GDR
19 - TB	20 - DENTIST
21 - DOCTOR	22 - PSYCH
23 - DRGICINC	24 - DRGALITG
25 - DRESPE	26 - HULFBDN
27 - SPECIST	28 - HUSPECO
29 - HOSPEXP	30 - DMIP
31 - SEXR	32 - CHILDOEP
33 - AGEDEP	34 - UMBAN
35 - POPINDEX	36 - FAMSIZE
37 - ETHNIC	38 - INCOME1
39 - INCOME15	40 - INCOMES
41 - RETAIL	42 - SERVICE
43 - HEALWELF	44 - LIBRARY
45 - CINEMA	46 - MUTEI
47 - FOOD	48 - ANTLIT
49 - SUICIDE	50 - ICELBORN
51 - CDR	52 - CRIME
53 - DOPE	54 - LAV
55 - JUVENILE	56 - PARTNATE
57 - UNEMPLOY	58 - MALEUR
59 - WHITE	60 - DEGREE
61 - POSTSEC	62 - ELEMENT
63 - PIRATIO	64 - VUTER
65 - SUSPANT	66 - S02
67 - NO2	68 - C02

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	35	8
	21	32
	36	31
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	13	1965
	66	46
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HORIZONTAL FACTOR 2 VERTICAL FACTOR 5

1 - SOCIAL	2 - MEWFARE
3 - FARMER	4 - ALEXEP
5 - CHILDEXP	6 - AUTOCAR
7 - TV	8 - COLDH2O
9 - NOBATH	10 - YEARS30
11 - CROWDED	12 - OWNERS
13 - VALUENSE	14 - MENT
15 - ROOMAVE	16 - 84
17 - IMR	18 - GDR
19 - TB	20 - DENTIST
21 - DOCTOR	22 - PSYCH
23 - DRCLIC	24 - DRAALIS
25 - DREESP	26 - WLFSDR
27 - SPECIST	28 - ROSEBED
29 - HOSPEXP	30 - UNIP
31 - BEXR	32 - CHILDEP
33 - AGEDEP	34 - UNBAN
35 - POPINDEX	36 - FAWBIZE
37 - ETHNIC	38 - INCOMEF
39 - INCOME15	40 - LCOMES
41 - RETAIL	42 - SERVICE
43 - HEALWELF	44 - LIBRARY
45 - CINEMA	46 - MOTEL
47 - FOOD	48 - ARTLIT
49 - SUICIDE	50 - ILLEBORN
51 - COR	52 - CRIME
53 - DOBE	54 - LAY
55 - JUVENILE	56 - PARTRATE
57 - UNEMPLOY	58 - TALEUR
59 - WHITE	60 - DEGREE
61 - POSTSEC	62 - ELEMENT
63 - PIRATIO	64 - VUTER
65 - SUBPART	66 - SUZ
67 - NO2	68 - CU2

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HORIZONTAL FACTOR 2 VERTICAL FACTOR 7

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1 - SOCIAL	2 - WELFARE	3 - FARMEN	4 - AGEEXP	5 - CHILDEN	6 - AUTOCAR	7 - TV	8 - CULDRD	9 - NOBATH	10 - YEAR830	11 - CROWDED	12 - BWNERS	13 - VALUENSS	14 - RENT	15 - MOONAVE	16 - BR	17 - INR	18 - DENTIST	19 - TB	20 - PSYCH	21 - DOCTOR	22 - DALLIG	23 - DRGIRC	24 - NULFROB	25 - DRESPE	26 - HUSPEB	27 - SPECIST	28 - HUSPEB	29 - HOSPEXP	30 - OIMP	31 - SEXN	32 - CHILDER	33 - AGEDEP	34 - UNBAY	35 - POPINDEX	36 - FAMSIZE	37 - ETHNIC	38 - INCOME	39 - INCOTE	40 - INCOME	41 - RETAIL	42 - SERVICE	43 - HEALWELF	44 - LIBRARY	45 - CINEMA	46 - MOTEL	47 - FOOD	48 - ACTLIT	49 - SUICIDE	50 - ILLEORN	51 - CDR	52 - CRITE	53 - DOPE	54 - LAM	55 - JUVENILE	56 - PARTRATE	57 - UNEMPLOY	58 - MALEUR	59 - WHITE	60 - DEGREE	61 - POSTSEC	62 - ELEMENT	63 - PTAFID	64 - VOTER	65 - SUSPART	66 - SUE	67 - NO2	68 - CDE	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

HORIZONTAL FACTOR 2 VERTICAL FACTOR 8

1 - SOCIAL	2 - WEAPARE
3 - FARMEN	4 - AGEEXP
5 - CHILDEXP	6 - AUTOCAR
7 - TV	8 - COLDR20
9 - NOBATH	10 - YEARS30
11 - CROWDED	12 - OWNERS
13 - VALUEHS	14 - RENT
15 - ROOMAVE	16 - 84
17 - IMR	18 - BUR
19 - TB	20 - DENTIST
21 - DOCTOR	22 - PSYCH
23 - DRCTRC	24 - DYMALIG
25 - DRHSP	26 - MURSON
27 - SPECIST	28 - MURPED
29 - MURPEXP	30 - DMIP
31 - SEXR	32 - CHILDEP
33 - AGEDP	34 - UNBAN
35 - POPINDEX	36 - FAMSIZE
37 - ETHNIC	38 - INCOME1
39 - INCOME15	40 - INCOMES
41 - RETAIL	42 - SERVICE
43 - HEALWELF	44 - LIBRARY
45 - CINEMA	46 - HOTEL
47 - FOOD	48 - AKTLIT
49 - SUICIDE	50 - ILLEGORN
51 - COR	52 - CHINE
53 - DOPE	54 - LAW
55 - JUVENILE	56 - PARFATE
57 - UNEMPLOY	58 - MALEBR
59 - WHITE	60 - DEGREE
61 - POSTSEC	62 - ELEMENT
63 - PIKATIO	64 - VOTER

15	27	21	22	32	36	31	45	47	49	51	53	55	57	59	61	63
10	20	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
15	27	21	22	32	36	31	45	47	49	51	53	55	57	59	61	63
10	20	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
15	27	21	22	32	36	31	45	47	49	51	53	55	57	59	61	63
10	20	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
15	27	21	22	32	36	31	45	47	49	51	53	55	57	59	61	63
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	1 - SOCIAL	2 - WELFARE
3 - FARMER	4 - AGEXAP	
5 - CHILDEXP	6 - AUTOCAR	
7 - TV	8 - COLDH20	
9 - NOBATH	10 - YEARG30	
11 - CROWDED	12 - UNEMP	
13 - VALUENSE	14 - RENT	
15 - RODHAYE	16 - B4	
17 - IMK	18 - GDR	
19 - TB	20 - DENTIST	
21 - DOCTOR	22 - PSYCH	
23 - DRCLRC	24 - DRALLIG	
25 - DRESBP	26 - WULFSON	
27 - SPECIALIST	28 - HUSBED	
29 - HOSPEXP	30 - OHIP	
31 - SEXR	32 - CHILDEF	
33 - AGEDEP	34 - UNLAY	
35 - POPINDEX	36 - FANBIZE	
37 - ETHNIC	38 - LYCONEF	
39 - INCOME15	40 - INCOMES	
41 - RETAIL	42 - SERVICE	
43 - HEALTHELF	44 - LIBRARY	
45 - CINEMA	46 - HOTEL	
47 - FOOD	48 - ARTLIT	
49 - SUICIDE	50 - ILLEORN	
51 - CDR	52 - CRIME	
53 - DOPE	54 - LAW	
55 - JUVENILE	56 - PATRIATE	
57 - UNEMPLOY	58 - MALEUR	
59 - WHITE	60 - DEGREE	
61 - POSTSEC	62 - ELEMENT	
63 - PTMA110	64 - VOTER	
65 - BUSPART	66 - B02	
67 - NO2	68 - CUE	

[illegible]

[illegible]

HORIZONTAL FACTOR 3 VERTICAL FACTOR 4

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1 - SOCIAL	2 - WELFARE	3 - FARMER	4 - AGEEXP	5 - CHILDEXP	6 - AUTOCAR	7 - TV	8 - COLDMD	9 - NOBATH	10 - YEARS30	11 - CRUMMED	12 - OWNERS	13 - VALUEMBE	14 - REQ7	15 - ROOMAVE	16 - BR	17 - TR	18 - GUR	19 - TB	20 - DENTIST	21 - DOCTOR	22 - PSYCH	23 - DRCLIC	24 - DRMALIG	25 - DRKESP	26 - WOLFSON	27 - SPECIST	28 - HOSPREB	29 - HOSPEXP	30 - OHIP	31 - SEXR	32 - CHILDEP	33 - AGEDEP	34 - URBAY	35 - POPINDEX	36 - FAMSIZ	37 - ETHNIC	38 - LYCOWF	39 - INCOME15	40 - LYCOWF	41 - RETAIL	42 - SERVICE	43 - MEALWELF	44 - LIBRARY	45 - CINEMA	46 - MOTEL	47 - FOOD	48 - ARTLIT	49 - SUICIDE	50 - ILLEBORN	51 - GDR	52 - CRIME	53 - DOPE	54 - LAW	55 - JUVENILE	56 - PARTRATE	57 - UNEMPLOY	58 - MALEUR	59 - WHITE	60 - DEGREE	61 - POSTSEC	62 - ELEMENT	63 - PIHATIO	64 - VOTER	65 - SUBPART	66 - B02	67 - NO2	68 - CO2	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

HORIZONTAL FACTOR 4

VERTICAL FACTOR 7

1 - SOCIAL	2 - WELFARE
3 - FARMEN	4 - AGEEXP
5 - CHILDEXP	6 - AUTOCAR
7 - TV	8 - COLDM20
9 - NOBATH	10 - YEARS30
11 - CROWDED	12 - OWNERS
13 - VALUEHSE	14 - RENT
15 - ROOMAVE	16 - BR
17 - IMR	18 - GDR
19 - TB	20 - DENTIST
21 - DOCTOR	22 - PSYCH
23 - DRCTIRC	24 - DRVALIO
25 - DRREXP	26 - WOLFSON
27 - SPECIST	28 - HUSPSED
29 - HOSREXP	30 - OITP
31 - SEXR	32 - CHILDOEP
33 - AGEDEP	34 - UNBAY
35 - POPINDEX	36 - FARMRIZE
37 - ETHNIC	38 - INCOME1
39 - INCOME15	40 - INCOMES
41 - RETAIL	42 - SERVICE
43 - HEALTHWLF	44 - LIBRARY
45 - CINEMA	46 - HOTEL
47 - FOOD	48 - ARTLITY
49 - SUICIDE	50 - ILLEBORN
51 - CDR	52 - CRIME
53 - DOPE	54 - LAW
55 - JUVENILE	56 - PARTRATE
57 - UNEMPLOY	58 - MALEUN
59 - WHITE	60 - DEGREE
61 - POSTSEC	62 - ECEMENT
63 - PTATATIO	64 - VOTER
65 - SUSPPART	66 - S02
67 - NO2	68 - C02

47	4066	45	34	53	41	43	25	2829
49	916446	4625	55	43	43	43	25	2829
35	4	22	22	22	22	22	25	2829
36	6	17	17	17	17	17	12	12
32	12	12	12	12	12	12	12	12
21	62	34	2361	41	43	43	25	2829
19	19	24	56	51	30	30	30	30
139	139	24	56	51	30	30	30	30
47	4066	45	34	53	41	43	25	2829
49	916446	4625	55	43	43	43	25	2829
35	4	22	22	22	22	22	25	2829
36	6	17	17	17	17	17	12	12
32	12	12	12	12	12	12	12	12
21	62	34	2361	41	43	43	25	2829
19	19	24	56	51	30	30	30	30
139	139	24	56	51	30	30	30	30
47	4066	45	34	53	41	43	25	2829
49	916446	4625	55	43	43	43	25	2829
35	4	22	22	22	22	22	25	2829
36	6	17	17	17	17	17	12	12
32	12	12	12	12	12	12	12	12
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139	139	24	56	51	30	30	30	30
47	4066	45	34	53	41	43	25	2829
49	916446	4625	55	43	43	43	25	2829
35	4	22	22	22	22	22	25	2829
36	6	17	17	17	17	17	12	12
32	12	12	12	12	12	12	12	12
21	62	34	2361	41	43	43	25	2829
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139	139	24	56	51	30	30	30	30
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49	916446	4625	55	43	43	43	25	2829
35	4	22	22	22	22	22	25	2829
36	6	17	17	17	17	17	12	12
32	12	12	12	12	12	12	12	12
21	62	34	2361	41	43	43	25	2829
19	19	24	56	51	30	30	30	30
139	139	24	56	51	30	30	30	30
47	4066	45	34	53	41	43	25	2829
49	916446	4625	55	43	43	43	25	2829
35	4	22	22	22	22	22	25	2829
36	6	17	17	17	17	17	12	12
32	12	12	12	12	12	12	12	12
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139	139	24	56	51	30	30	30	30
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36	6	17	17	17	17	17	12	12
32	12	12	12	12	12	12	12	12
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19	19	24	56	51	30	30	30	30
139	139	24	56	51	30	30	30	30
47	4066	45	34	53	41	43	25	2829
49	916446	4625	55	4				

1 - SOCIAL	2 - WELFARE
3 - FARMER	4 - AUTOCAR
5 - CHILDEXP	6 - COLDH2O
7 - TV	8 - YEAR830
9 - NOBATH	10 - OWNERS
11 - CROWDED	12 - RENT
13 - VALUEHSE	14 - RENT
15 - ROOMMATE	16 - RENT
17 - IMR	18 - GDR
19 - TB	20 - DENTIST
21 - DOCTOR	22 - PSYCH
23 - DRCLRC	24 - DRALIG
25 - DRRESP	26 - WULFBDN
27 - SPECIST	28 - MURBED
29 - HDBPERP	30 - DRIP
31 - SEXR	32 - CHILDEP
33 - AGEDEP	34 - URBAN
35 - POPINDEX	36 - FARGIZE
37 - ETHNIC	38 - YCODEF
39 - INCOME15	40 - INCOME8
41 - RETAIL	42 - SERVICE
43 - HEALTHELF	44 - LIBRARY
45 - CINEMA	46 - HOTEL
47 - FOOD	48 - ARTLIT
49 - SUICIDE	50 - LLEBORN
51 - CDR	52 - CRIME
53 - DOPE	54 - LAW
55 - JUVENILE	56 - PARTPRATE
57 - UNEMPLOY	58 - MALEUR
59 - WHITE	60 - DEGREE
61 - POSTSEC	62 - ELEMENT
63 - PTRATIO	64 - VOTER
65 - SUBPART	66 - SDR
67 - NO2	68 - CUE

HORIZONTAL FACTOR 5		VERTICAL FACTOR 7			
1	SOCIAL	1	1	1	1
2	WELFARE	2	2	2	2
3	FAMEN	3	3	3	3
4	AGEEXP	4	4	4	4
5	CHILDEXP	5	5	5	5
6	AJTOCAR	6	6	6	6
7	TV	7	7	7	7
8	CULDEAD	8	8	8	8
9	NOBATH	9	9	9	9
10	YEARS30	10	10	10	10
11	CROWDED	11	11	11	11
12	OWNERS	12	12	12	12
13	VALUENSE	13	13	13	13
14	RENT	14	14	14	14
15	ROOMAVE	15	15	15	15
16	DR	16	16	16	16
17	THR	17	17	17	17
18	CDR	18	18	18	18
19	TS	19	19	19	19
20	DENTIST	20	20	20	20
21	DOCTOR	21	21	21	21
22	PSYCH	22	22	22	22
23	DRCLRC	23	23	23	23
24	DRMALIG	24	24	24	24
25	DRRESB	25	25	25	25
26	DRFSON	26	26	26	26
27	SPECIST	27	27	27	27
28	HOSPESD	28	28	28	28
29	HOSPEXP	29	29	29	29
30	ONIP	30	30	30	30
31	SEX	31	31	31	31
32	CHILDEP	32	32	32	32
33	AGEDP	33	33	33	33
34	URBAN	34	34	34	34
35	POPINDEX	35	35	35	35
36	FAMSIZE	36	36	36	36
37	ETHNIC	37	37	37	37
38	INCOME	38	38	38	38
39	INCOME15	39	39	39	39
40	INCOMES	40	40	40	40
41	RETAIL	41	41	41	41
42	SERVICE	42	42	42	42
43	HEALWELF	43	43	43	43
44	LIBRARY	44	44	44	44
45	CINEMA	45	45	45	45
46	FOOD	46	46	46	46
47	ARTLIT	47	47	47	47
48	LIBBORN	48	48	48	48
49	BUICID	49	49	49	49
50	CRIME	50	50	50	50
51	CDR	51	51	51	51
52	DOPE	52	52	52	52
53	JUVENILE	53	53	53	53
54	PARTRATE	54	54	54	54
55	UNEMPLOY	55	55	55	55
56	WHITE	56	56	56	56
57	POSTSEC	57	57	57	57
58	PTATID	58	58	58	58
59	SUSPANT	59	59	59	59
60	NO2	60	60	60	60
61	CO2	61	61	61	61
62	CO2	62	62	62	62
63	CO2	63	63	63	63
64	CO2	64	64	64	64
65	CO2	65	65	65	65
66	CO2	66	66	66	66
67	CO2	67	67	67	67

HORIZONTAL FACTOR 5 VERTICAL FACTOR 8

1 - SOCIAL	2 - WELFARE
3 - FARMEN	4 - AGEEXP
5 - CHILDEXP	6 - AUTOCAR
7 - TV	8 - COLORDO
9 - NOBATH	10 - YEARS30
11 - CROWDED	12 - OWNERS
13 - VALUEHSE	14 - RENT
15 - ROOMAVE	16 - B4
17 - IMR	18 - WDR
19 - TB	20 - DENTIST
21 - DOCTOR	22 - PSYCH
23 - DACTIAC	24 - DRAHTY
25 - DRRESP	26 - WOLFSON
27 - SPECIST	28 - HOSPEDO
29 - HOSPEXP	30 - ONIP
31 - SEXR	32 - CHILDOEP
33 - AGEDEP	34 - URBAN
35 - POPINDEX	36 - FANSTZE
37 - ETHNIC	38 - INCOME1
39 - INCOME15	40 - INCOMES
41 - RETAIL	42 - SERVICE
43 - HEALTHWLF	44 - LIBRARY
45 - CINEMA	46 - HOTEL
47 - FOOD	48 - ARTLIT
49 - SUICIDE	50 - ILLEBORN
51 - COR	52 - CRIME
53 - DOPE	54 - LAW
55 - JUVENILE	56 - PAYTRATE
57 - UNEMPLOY	58 - MALEUR
59 - WHITE	60 - DEGREE
61 - POSTSEC	62 - ELEMENT
63 - PTRATIO	64 - VOTER
65 - SUSPART	66 - SDE
67 - MO2	68 - CO2

53	13634	58	5932182	43
14	14674860	68		
60	393034	68		
1611	65	56	17	
37	45294	64		
31	52	28		
21				
32		15		22
36		10		

APPENDIX C : MATRIX OF EIGHT ROTATED COMPONENTS.

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5	FACTOR 6	FACTOR 7	FACTOR 8
SOCIAL	-.56430	.19484	.45027	-.00649	-.02859	.57771	.11638	.06180
WELFARE	-.14923	.08128	.54888	-.00742	-.02702	.48581	.34532	.04437
PANISH	-.62305	.12117	.37844	-.00748	-.04957	.50122	-.02259	-.02670
AGEEXP	-.16189	.84196	-.01098	-.14423	.09765	.12388	-.12433	.20425
CHILDEXP	-.14935	.11858	.24886	.37111	-.09944	.25887	.49359	.13463
AUTOCAR	.70860	-.26772	-.37557	-.16246	-.03511	-.15929	-.24214	-.00624
TV	.88280	-.02438	-.00559	.01469	-.09644	-.05880	.01481	-.07845
COLDW20	-.79232	-.07890	.19668	-.30894	-.08848	.19732	.07264	.23777
MOBATH	-.77275	.25413	-.06823	-.23931	.03530	.37884	-.09580	.06564
YEARS30	.72805	-.21466	-.17920	.13277	.18031	-.18498	.08420	-.39679
CROWDED	-.40533	.68272	.36150	-.17222	-.27652	.25809	-.07090	-.02504
OWNERS	-.58723	-.19274	-.29330	-.28886	-.04596	-.17110	-.35409	.11350
VALUEUSE	.89483	-.21140	-.14257	-.04944	-.06491	.00426	.18543	.12898
RENT	.95177	-.07869	.00787	.02835	-.09406	.08958	.11477	.07767
ROOMAVE	.05735	-.67933	-.54535	-.12818	.07742	-.16862	-.06072	-.29592
BR	.34872	.78049	.01193	.02551	-.20326	-.02018	-.06475	-.02074
JMR	-.34197	.33787	.19277	-.08000	.22232	.09489	-.25635	-.02517
QDR	-.79996	-.24323	-.22079	.02621	.24513	.05957	.02623	.10411
TB	-.05713	.84856	.01384	.02034	.08398	.11264	.18578	-.04414
DENTIST	.59934	-.13909	-.13107	.32626	.23675	.01136	.00629	.22775
DOCTOR	-.53682	.15695	-.17799	-.45145	-.42206	-.07910	-.03006	-.17010
PSYCH	-.13928	.18293	-.02270	.15145	.59943	-.24476	.10870	-.21972
DRCTRC	-.70384	-.36393	-.18950	.06076	.36343	.04820	-.03872	.13026
DRMALIG	-.52539	-.40655	-.01789	.07572	.36904	-.13188	.18677	.15334
DRRESP	-.69289	-.07552	.17506	.05633	.30461	.06326	-.07307	.18762
WOLFSON	.17700	-.07227	.04711	.70796	.29784	-.17442	-.10370	.18671
SPECIST	-.17003	-.02962	-.26125	-.11320	-.21409	-.24232	.05589	-.27311
MOSPEP	-.32600	.22371	-.01545	.83837	.02432	.17469	.11264	-.11484
MOSPEXP	.14225	.05151	.00644	.86619	-.01165	.16473	.10676	-.06071
OHIP	.60659	-.14309	-.01256	.63473	-.13491	-.00275	.20425	.02772
SEXK	-.25840	.57048	-.04918	-.30841	-.45461	-.08492	-.25683	-.12332
CHILDDP	-.12648	.47194	.13654	-.42264	-.24977	.05089	-.38528	-.25434
AGEDEP	-.74325	-.42852	-.29572	.03928	.27326	-.04308	.07043	.14314
URBAN	.73534	.13709	.34191	.31987	-.05527	-.05403	.04900	.03498
POPINDEX	.62001	-.19633	-.22738	-.24853	-.21287	.09460	-.11488	.36374
FAMSIZE	-.19905	.39582	.32523	-.30009	-.42479	.25765	-.28291	-.39135
ETHNIC	.22638	.63575	.16604	.24386	-.28931	-.09492	.20596	-.09319
INCOME	.95943	.05003	.03539	.08297	-.15527	.00978	.06080	.00725
INCOME15	.90876	.00745	.00381	.02264	-.19745	.15463	.10652	.03041
INCOMES	.92030	-.08404	-.12023	-.42002	.06224	.19425	.02258	.01492
RETAIL	.36167	.10895	.14218	.39179	.14863	.09742	-.02799	.65558
SERVICE	.31908	.24319	.16049	.19739	.09374	.17784	.42025	.66252
SOCALWELF	.14625	-.04345	-.06532	.49346	.50270	.10014	-.08617	.11404
LIBRARY	.59508	-.05040	.04794	.15909	.08036	.53274	.37458	.04634
CINEMA	-.27773	.55651	.26372	.16178	-.06986	-.13206	.03436	-.09648
HOTEL	-.55722	.32036	.10604	-.07785	-.02827	.02873	-.04885	.57748
FOOD	-.21604	-.01251	-.09689	-.10531	-.12087	-.04983	.07853	.58192
ARTLIT	.43737	-.01697	-.03794	.16634	.06486	.19905	.27255	.05657
SUICIDE	-.22848	-.00220	.05414	-.21798	.63253	-.05387	.15114	.02552
ILLEGORN	-.20406	.68194	-.10308	.03780	.27430	.37595	.00533	.21243
CDR	.56448	-.12182	.05012	.38093	.33846	-.18108	.31327	.21139
CRIME	.17638	.46587	.23393	.17534	-.21913	.01624	.08864	.22456
DOPE	.32051	.06473	.22763	.43938	-.15151	.06923	.02007	.10408
LAW	.25867	-.25671	-.14828	.19699	.34719	-.26424	.40932	.43670
JUVENILE	-.08163	.61759	-.00745	.17497	.07212	.39914	-.05321	.03292
PARTRATE	.79081	-.10740	-.37235	.24718	.06092	-.18231	.14715	-.00144
UNEMPLOY	.08438	.18621	.90380	.00446	-.01746	-.09026	.00022	-.03450
MALEVA	-.15029	.15526	.88518	.04824	.08449	.02560	.08975	.10839
WHITE	.84640	-.08402	.15534	.10843	.20240	.30888	.09227	.13344
DEOREE	.72772	-.07979	-.02464	.24634	.11263	.40978	.21866	.07104
POSTSEC	.84200	-.19184	-.13263	.13236	.27249	.01748	-.02697	.17163
ELEMENT	-.18444	.24789	.18380	-.19782	-.24163	-.00554	-.03577	-.14354
PTRATIO	-.28217	-.10827	-.44994	.02539	-.02701	-.61463	.22307	.11998
VOTER	-.03225	-.18390	.12125	-.14622	.10342	-.58110	-.06320	-.06714
SUSPART	.08024	.82829	.14875	-.08401	-.28087	.02880	.27655	-.03071
SOZ	.13150	.17308	-.01194	-.07741	-.44477	-.08496	.01460	.03691
MOZ	.48575	.15781	.05895	.01754	.00230	.03524	.72429	.07301
COZ	.34283	.58140	.10768	.01470	.08504	.01406	.66718	.04611

APPENDIX D: List of Berry's factor scores for municipalities

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based on analysis of untransformed percentage
data.

OBSERVATION	FACTOR SCORES				COUNTY	MUNICIPALITY
	1	2	3	4		
1	0.28	0.58	-0.09	-0.14	ALGOMA 1	1
2	-0.38	2.21	-0.07	-0.53		2
3	1.31	0.89	-0.03	-1.18		3
4	2.14	-0.25	-0.11	0.37		4
5	0.33	-0.39	-0.11	-0.31		5
6	-0.29	-0.56	0.39	-0.14		7
7	0.45	-0.34	-0.06	-0.34		8
8	-0.29	2.28	-0.08	-0.42		9
9	0.46	0.07	-0.11	-0.87		10
10	1.47	1.84	0.02	0.54		11
11	0.55	-0.98	-0.03	-0.90		12
12	0.43	-0.51	-0.10	-0.25		13
13	-0.10	-1.84	0.37	-0.47		15
14	-1.04	-1.53	-0.09	1.04		16
15	-0.71	1.22	-0.01	0.14		17
16	-1.84	-0.32	0.06	5.11		18
17	-0.64	1.47	-0.06	-0.33	BRANT 2	1
18	-1.63	-0.01	0.01	0.69		2
19	-0.97	1.21	-0.01	-1.17		3
20	-1.19	1.43	-0.13	0.32		4
21	-0.68	0.62	-0.11	-0.39	BRUCE 3	5
22	0.67	-1.27	0.23	0.61		6
23	0.38	-0.90	-0.09	-0.43		1
24	0.13	-0.73	0.19	-0.18		2
25	-0.42	-0.19	-0.14	-0.03		3
26	-0.92	-0.18	-0.04	0.42		4
27	-0.54	-0.27	-0.01	-0.46		5
28	-1.19	-0.95	0.11	0.63		6
29	-0.85	-0.16	-0.01	-0.09		7
30	0.11	-1.50	0.07	-0.88		8
31	-0.82	-0.39	0.04	-0.54		9
32	-1.30	-1.11	0.10	0.27		10
33	-0.91	0.23	-0.07	-0.72		11
34	-1.04	-1.06	0.04	-0.61		12
35	-0.81	-1.55	-0.07	-0.38		13
36	0.38	-3.77	-0.14	-1.05		14
37	-0.29	-1.40	-0.17	-0.20	CARLETON 4	15
38	-0.48	-0.09	-0.05	-0.55		16
39	-0.62	-0.01	0.03	-0.85		1
40	0.45	1.26	-0.15	-0.55		3
41	-0.21	1.28	-0.04	-1.75		4
42	0.44	0.96	-0.14	-0.80		5
43	-0.32	-0.23	0.08	-0.30		6
44	0.42	0.26	-0.11	-0.34		7
45	-0.18	0.89	-0.14	-0.59		9
46	-0.02	0.67	-0.18	0.04		10
47	0.54	0.81	-0.85	1.04	COCHRANE 5	1
48	0.21	1.27	-0.09	1.49		2
49	-0.85	1.83	-0.11	1.78		3
50	-0.03	0.01	-0.23	2.26		4
51	-2.14	0.95	-0.15	2.41		5
52	-1.14	1.60	-0.24	5.03		6

OBSERVATION	FACTOR SCORES				COUNTY	MUNICIPALITY
	1	2	3	4		
53	-0.04	0.98	-0.20	1.91		8
54	0.50	0.96	-0.12	1.86		9
55	0.07	1.39	-0.21	2.40		11
56	-0.68	-0.75	0.12	-0.31	DUFFERIN 6	1
57	-1.42	-0.41	-0.09	0.04		2
58	-0.78	0.51	0.85	-0.24		3
59	-0.62	-0.13	-0.09	0.29		4
60	0.06	0.56	-0.11	-0.18		5
61	-0.67	-0.40	0.07	0.04		6
62	-0.29	-1.16	0.09	0.33	DUNDAS 7	1
63	-0.65	-0.90	-0.08	-0.07		2
64	0.02	-0.56	-0.01	0.09		3
65	-0.85	-0.43	-0.11	0.05		4
66	-0.55	-0.32	0.07	-0.28	DURHAM 8	1
67	0.09	-0.10	0.05	-0.99		2
68	-0.43	0.54	-0.05	-0.29		3
69	-0.60	1.00	-0.07	0.12		4
70	0.13	0.49	-0.06	-0.24		5
71	0.04	-0.06	-0.01	0.33		6
72	-1.05	0.10	-0.04	-0.05	ELGIN 9	1
73	-1.87	0.11	0.01	0.61		2
74	-1.03	0.16	0.01	-1.23		3
75	-0.41	-0.55	-0.02	-1.25		4
76	-1.48	0.25	-0.01	-0.24		5
77	-0.70	0.57	0.01	-1.07		6
78	-0.76	1.31	-0.06	0.10		7
79	-0.23	1.44	-0.02	0.53	ESSEX 10	1
80	-0.60	0.37	-0.01	0.55		2
81	-1.30	0.45	0.03	-0.03		3
82	-0.72	0.98	-0.03	0.22		4
83	-0.76	1.13	-0.02	-0.27		5
84	-0.35	1.43	-0.05	0.07		6
85	-1.20	1.14	-0.05	-0.30		7
86	-0.91	0.88	-0.01	0.63		8
87	-0.88	0.26	-0.06	0.85		9
88	-1.16	0.34	-0.03	0.48		10
89	-1.09	0.42	-0.11	0.67		14
90	-0.59	0.63	-0.05	0.22		15
91	1.36	-0.65	0.13	0.13	FRONTENAC 13	1
92	1.09	-1.66	-0.08	-0.45		2
93	1.59	-1.01	0.04	-0.22		3
94	1.05	-0.83	-0.14	0.06		4
95	0.54	-0.15	0.79	-1.05		5
96	2.20	-1.06	0.12	0.07		6
97	0.54	1.91	-0.11	-1.12		7
98	0.34	-0.13	-0.02	-0.97		8
99	0.79	-1.42	0.06	0.52		9
100	0.74	-0.72	-0.03	-0.74		10
101	2.40	-0.57	0.13	-0.34		11
102	0.09	-0.46	0.04	-0.02		13
103	-0.13	-0.07	0.03	-0.69		14
104	-0.12	-1.04	-0.11	-0.92		15
105	0.07	0.27	0.03	0.69	GLENGARRY 12	1
106	0.52	-0.84	-0.01	1.06		2
107	0.06	-0.22	0.05	0.97		3
108	0.45	-0.99	0.08	1.33		4

OBSERVATION	FACTOR SCORES				COUNTY	MUNICIPALITY
	1	2	3	4		
109	0.75	0.67	-0.10	-1.58	GRENVILLE 13	1
110	0.09	-0.24	-0.09	-1.27		2
111	-0.17	-1.07	-0.17	-1.33		3
112	0.85	-0.51	0.01	-1.58		4
113	0.32	-0.34	-0.13	-1.59	GREY 14	5
114	0.29	-0.86	0.05	-1.39		1
115	-0.30	-1.30	0.16	-0.89		2
116	-0.01	0.31	-0.04	-1.48		3
117	-0.31	0.22	-0.01	-1.23		4
118	-0.43	0.10	-0.13	0.13		5
119	-0.73	-1.61	0.05	-1.22		6
120	0.45	-1.02	-0.12	-0.76		7
121	0.39	-0.72	-0.04	-1.17		8
122	-0.13	-0.92	-0.09	-1.15		9
123	-0.69	-0.74	-0.12	-0.08		10
124	-0.15	-1.11	-0.08	-1.08		11
125	0.08	-0.70	-0.07	-1.08		12
126	-0.53	0.03	-0.12	-0.82		13
127	-0.03	0.10	0.02	-1.29		14
128	-0.49	-1.80	0.13	-0.56		15
129	0.01	-0.23	-0.03	-1.03	HALDIMAN 15	16
130	0.26	0.90	-0.13	-0.80		1
131	-0.10	0.36	-0.07	-1.45		2
132	-0.30	0.20	-0.11	-0.43		3
133	-0.40	0.36	-0.11	-0.88		4
134	-0.06	-0.07	-0.11	-0.28		5
135	-1.33	0.36	0.05	-0.63		6
136	-0.40	-0.15	-0.07	-0.80		7
137	-0.37	0.90	-0.16	-0.35		8
138	0.86	0.65	-0.11	-0.13		9
139	-0.67	0.45	-0.13	-0.53	HALIBURTON 16	10
140	1.77	1.43	-0.08	0.12		1
141	-0.29	2.60	-0.10	-0.38		2
142	0.28	-0.33	-0.01	0.54		3
143	2.36	1.20	0.01	0.52		4
144	2.78	1.01	-0.02	0.34		5
145	1.72	-0.10	-0.08	-0.13		6
146	2.66	0.51	-0.05	0.47	HALTON 17	7
147	-1.75	0.97	-0.16	0.98		8
148	0.54	-1.90	0.15	-0.30		9
149	1.20	0.66	-0.12	0.60		10
150	-0.54	1.10	-0.03	-0.81		1
151	0.04	1.08	-0.17	-0.41	HASTINGS 18	2
152	1.52	-1.06	0.19	0.48		1
153	1.57	-0.87	-0.18	-0.61		2
154	0.89	-0.72	0.02	0.02		3
155	0.87	-1.69	0.10	-0.06		4
156	1.94	1.70	-0.10	0.18		5
157	1.92	-0.48	-0.08	0.05		6
158	0.18	-1.09	0.11	-0.68		7
159	0.48	-0.53	-0.17	-0.50		8
160	1.32	-0.54	-0.12	-0.17		9
161	-0.30	-1.68	0.07	-0.45		10
162	0.62	-1.19	-0.03	-0.83		11
163	1.42	-1.47	-0.16	0.08		12
164	1.52	-0.68	-0.12	0.63		13

OBSERVATION	FACTOR SCORES				COUNTY	MUNICIPALITY
	1	2	3	4		
165	-0.64	-1.32	0.02	-0.50	HURON 19	14
166	0.09	1.46	-0.12	-1.57		15
167	-0.41	0.55	-0.14	-0.43		16
168	1.73	-1.10	0.09	0.28		17
169	0.20	-1.12	0.01	-0.82		18
170	1.65	-0.81	-0.13	0.02		19
171	-0.91	-1.38	0.20	-0.97		1
172	-0.44	-0.05	0.03	-1.07		2
173	-0.46	0.24	0.09	-0.58		3
174	-1.18	-0.79	0.06	-0.76		4
175	-0.84	0.10	-0.10	-0.33		5
176	-1.25	-0.47	-0.07	-0.24		6
177	-1.10	-0.15	0.03	0.56		7
178	-1.83	-1.60	0.44	-0.76		8
179	-1.33	-1.41	0.17	-0.97		9
180	-0.80	-0.21	0.11	-2.08		10
181	-0.32	1.08	-0.01	-1.17		11
182	-0.79	1.31	-0.06	-0.90		12
183	-1.02	-1.79	0.07	-0.73		13
184	-1.58	-0.30	-0.06	-0.73	KENORA 20	14
185	-1.02	-0.78	-0.05	-0.91		15
186	-0.79	-0.45	-0.12	-1.01		16
187	-1.14	0.47	-0.23	3.26		1
188	-0.52	1.17	-0.20	0.96		2
189	0.17	-0.16	-0.23	1.37	PATRICIA PORTION	3
190	-0.90	-0.08	-0.26	0.93		4
191	-0.69	2.18	-0.08	1.64	KENT 21	1
192	-1.30	-0.33	-0.12	3.28		2
193	-0.63	-0.39	0.22	-2.47	LAMBTON 22	1
194	-1.29	0.55	0.05	0.18		2
195	-1.43	0.20	0.02	0.46		3
196	-2.15	0.73	-0.06	-0.29		4
197	-1.41	-0.51	0.11	-0.59		5
198	-0.78	-0.02	-0.00	-0.51		6
199	-0.98	0.91	-0.00	-0.05		7
200	-1.15	0.42	-0.01	0.42		8
201	-1.37	0.62	-0.06	0.63		9
202	-0.67	0.53	-0.07	0.07		10
203	-0.71	0.18	-0.03	-0.46	LANARK 23	1
204	-0.76	-0.55	0.02	-0.51		2
205	-0.46	-1.21	-0.04	-0.58		3
206	-0.32	0.43	-0.14	-0.11		4
207	-0.26	-0.68	-0.06	-0.46		5
208	-0.07	1.27	-0.05	-0.63		6
209	-0.17	0.34	-0.03	-0.44		7
210	-0.32	1.20	-0.07	-0.10		8
211	0.17	0.60	0.06	0.17		9
212	-0.97	-0.34	-0.02	-0.42		10
213	0.53	-0.74	-0.16	-0.85		1
214	0.75	0.09	-0.05	-0.79		2
215	0.75	-0.44	-0.18	-1.04		3
216	0.62	-2.01	0.33	-0.64		4
217	0.96	-2.62	0.06	3.74		5
218	-0.03	-0.65	0.07	-1.17		6
219	0.65	0.28	-0.16	-0.70		7
220	0.53	-0.74	-0.10	-0.82		8

OBSERVATION	FACTOR SCORES				COUNTY	MUNICIPALITY
	1	2	3	4		
221	0.60	-1.33	-0.12	0.69	LEEDS 24	9
222	0.87	0.70	-0.03	4.39		10
223	-0.10	-0.06	0.06	-0.83		11
224	-0.17	-0.42	0.00	-0.83		12
225	1.37	-0.86	-0.14	-0.50		13
226	0.14	-0.88	-0.07	-1.51		1
227	1.03	-0.30	0.04	-2.27		2
228	0.31	-0.96	-0.06	-1.65		3
229	0.11	0.43	-0.13	-0.44		4
230	0.85	0.82	-0.14	-1.68		5
231	0.73	-0.22	-0.05	-1.07		6
232	0.32	-0.59	-0.01	-1.05		7
233	0.25	-0.00	-0.06	-1.40		8
234	0.18	-0.68	-0.03	-1.48		9
235	0.63	-0.69	0.04	-0.14	LENNOX 25	10
236	0.15	-0.14	-0.19	-0.63		11
237	-0.17	-0.03	-0.14	-1.15		1
238	1.38	-1.09	-0.26	-2.40		2
239	0.49	-0.87	-0.00	-1.27		3
240	1.64	-0.79	-0.04	0.23		4
241	0.88	1.18	-0.12	-1.71		5
242	0.51	-0.44	-0.03	-1.16		6
243	-0.22	0.03	-0.15	-1.84		7
244	1.52	-1.59	-0.00	-0.83		8
245	-0.31	-0.80	-0.08	-1.27		9
246	0.08	-2.26	0.01	-1.52		10
247	-0.57	0.02	-0.01	0.18	LINCOLN 26	1
248	-0.02	1.54	-0.04	-0.96		2
249	-0.42	-0.17	-0.05	-0.17		3
250	0.50	2.36	-0.06	-1.85		4
251	-0.12	0.91	-0.07	-0.87		5
252	-0.83	1.39	-0.03	-1.13		6
253	-0.02	1.55	-0.07	-0.45		7
254	0.97	-0.26	-0.15	-1.05	MANITOULIN 27	1
255	-0.47	-0.34	0.81	-0.72		2
256	0.66	-0.19	-0.07	-0.24		3
257	0.28	-1.85	-0.15	0.36		4
258	0.82	-0.30	-0.10	-1.21		5
259	-1.82	-2.61	-0.16	2.99		6
260	0.36	1.24	-0.03	-1.49		7
261	1.16	0.02	-0.13	-0.25		8
262	-1.06	-0.28	-0.20	0.90		9
263	0.26	-1.57	-0.03	-1.06		10
264	1.04	-0.47	-0.07	-0.71	MIDDLESEX 28	11
265	-1.26	0.39	-0.11	-0.14		1
266	-0.59	0.42	-0.04	-0.81		2
267	-1.60	0.08	0.11	0.65		3
268	-0.37	1.61	-0.12	-0.75		4
269	-0.93	0.88	-0.08	-0.22		5
270	-0.82	-0.54	0.13	-0.46		6
271	-0.62	0.60	-0.05	-0.55		7
272	-0.95	-0.04	0.05	-0.48		9
273	-0.71	-0.59	-0.10	-0.36		10
274	-0.26	-0.27	-0.03	-0.39		11
275	-0.71	0.79	-0.04	-0.48		12
276	-0.85	-0.06	-0.20	-0.57		14

OBSERVATION	FACTOR SCORES				COUNTY	MUNICIPALITY
	1	2	3	4		
277	-0.50	0.09	-0.13	0.12	MUSKOKA 29	15
278	-0.20	-0.50	-0.06	0.04		1
279	-0.37	-3.15	-0.15	-0.97		2
280	0.05	0.58	-0.03	0.39		3
281	1.86	0.06	-0.04	0.52		4
282	0.17	0.50	-0.01	-0.37		5
283	-0.44	0.91	23.34	-1.75		6
284	-1.25	0.09	-0.04	0.21		7
285	1.11	0.19	-0.07	0.33		8
286	1.35	1.80	-0.04	-0.72		9
287	0.53	0.59	-0.05	-0.57		10
288	-1.00	-0.71	0.17	-0.80		11
289	0.31	0.07	0.08	0.91		12
290	0.68	0.46	-0.10	0.28		13
291	-1.98	-0.07	0.25	0.28		14
292	0.54	-0.85	-0.15	0.72		15
293	0.55	-0.55	-0.08	-0.35		16
294	0.80	-0.74	-0.07	0.12		17
295	0.54	-0.74	0.10	-0.24	NIPISSING 30	18
296	0.49	-1.22	0.09	0.53		1
297	-1.33	-0.52	0.27	1.31		2
298	0.85	-2.23	-0.01	0.72		3
299	0.10	-1.97	-0.08	1.20		4
300	0.52	-0.99	-0.12	1.15		5
301	1.69	0.83	-0.03	1.15		6
302	-2.27	0.49	-0.05	1.93		7
303	0.31	-0.63	0.07	1.62		8
304	4.25	-0.73	-0.10	1.26		9
305	0.41	-1.18	0.10	1.68		10
306	-0.15	-0.04	0.04	1.18		11
307	-0.33	1.84	-0.07	-0.20	NORFOLK 31	12
308	-2.32	-0.18	-0.06	1.47		1
309	-2.46	-0.44	0.02	1.93		2
310	-2.36	0.43	0.02	1.34		3
311	-0.79	0.40	-0.02	1.02		4
312	-2.91	-0.11	-0.06	1.35		5
313	-1.40	-0.24	-0.08	0.69		6
314	-2.35	0.35	0.02	1.36		7
315	-0.35	1.16	-0.10	0.01	NORTHUMBERLAND 32	8
316	0.04	-0.55	-0.09	1.38		1
317	-0.39	0.02	0.01	-0.07		2
318	0.06	0.42	-0.06	0.38		3
319	-0.10	0.44	-0.03	0.38		4
320	-0.20	1.22	-0.08	-0.47		5
321	-0.82	-0.60	-0.11	0.21		6
322	0.46	0.79	-0.07	0.16		7
323	0.05	-0.37	-0.13	-0.04	ONTARIO 33	8
324	-0.48	-0.38	-0.04	0.31		9
325	-0.84	-0.39	-0.06	-0.63		1
326	0.69	-0.02	-0.00	-0.65		2
327	0.42	-0.86	-0.08	-0.70		4
328	-0.55	-0.25	0.02	-0.77		5
329	-0.68	0.00	-0.01	-0.42		6
330	-0.52	0.18	-0.07	-0.68		7
331	0.19	-0.38	-0.10	-0.93		8
332	0.36	0.47	-0.05	-0.47		9

OBSERVATION	FACTOR SCORES				COUNTY	MUNICIPALITY
	1	2	3	4		
333	-0.14	1.72	-0.06	-0.74	OXFORD 34	10
334	-0.13	1.52	-0.09	-0.45		11
335	-1.48	-0.75	0.08	-0.36		1
336	-1.15	0.47	-0.05	-0.50		2
337	-1.23	0.39	-0.04	-0.78		3
338	-1.01	0.83	-0.11	-1.08		4
339	-1.22	0.50	-0.07	-0.56		5
340	-2.28	0.53	0.01	0.59		6
341	-0.83	0.93	-0.02	-0.79		7
342	-1.13	0.59	-0.09	-0.84		8
343	-1.47	0.54	-0.00	-0.33		9
344	-1.58	0.51	-0.01	1.04	PARRY SOUND 35	10
345	-1.13	-0.29	-0.06	-1.14		11
346	1.15	0.73	-0.00	-0.05		1
347	1.49	0.68	-0.14	0.92		2
348	1.46	0.31	-0.12	1.35		3
349	0.65	-1.29	-0.09	0.40		4
350	1.58	1.22	-0.12	0.87		5
351	1.28	-1.37	0.16	0.12		6
352	3.42	1.06	0.00	0.70		7
353	-0.13	0.16	-0.11	1.04		8
354	1.07	0.28	-0.09	-0.23		9
355	1.96	0.23	-0.08	0.32	PEEL 36	10
356	0.14	0.91	-0.07	1.26		11
357	1.71	0.92	-0.14	-0.12		12
358	3.11	-0.22	0.01	0.55		13
359	1.68	-1.15	0.32	0.85		14
360	0.57	-0.48	-0.13	0.71		15
361	1.23	-0.23	0.02	0.56		16
362	1.64	0.44	-0.17	1.32		17
363	1.68	1.56	0.10	0.09		18
364	-0.17	1.12	-0.13	-1.03		1
365	0.03	0.81	-0.05	-1.25	PERTH 37	2
366	-1.21	1.40	-0.11	-0.71		3
367	-0.41	0.94	0.05	-1.10		5
368	-1.28	0.00	-0.08	-0.42		1
369	-1.24	0.34	0.01	-0.15		2
370	-1.53	-0.32	-0.11	0.47		3
371	-1.32	-0.81	0.17	0.36		4
372	-0.99	0.27	-0.09	0.58		5
373	-1.68	-0.56	0.11	-0.05		6
374	-1.71	-0.71	-0.06	-0.12		7
375	-1.65	-0.78	-0.07	-0.17		8
376	-1.43	-0.15	-0.11	0.66	PETERBOROUGH 38	9
377	-1.59	-1.01	0.06	0.64		10
378	-1.25	-0.68	-0.05	0.00		11
379	-0.26	-0.59	0.12	-0.92		1
380	1.08	-0.71	0.06	-0.50		2
381	1.43	0.48	-0.04	-1.22		3
382	2.09	-1.05	-0.15	-0.16		4
383	0.89	0.86	-0.05	-1.34		5
384	0.69	-1.22	0.08	-0.34		6
385	0.98	0.35	-0.10	-1.37		7
386	1.26	-1.06	-0.10	-1.34		8
387	0.51	-0.61	-0.05	-0.68		9
388	-0.40	0.29	-0.01	-0.55		11

OBSERVATION	FACTOR SCORES				COUNTY	MUNICIPALITY
	1	2	3	4		
389	-0.41	0.28	-0.02	-1.22	PRESCOTT 39	12
390	0.19	-0.84	0.07	1.41		1
391	0.23	-1.75	-0.05	0.86		2
392	-0.09	-0.31	-0.02	0.83		3
393	0.54	0.74	-0.14	-0.06		4
394	0.58	0.30	-0.19	0.72	PRINCE EDWARD 40	5
395	-0.05	0.18	-0.00	0.62		6
396	-1.06	-1.47	0.27	0.78		7
397	-0.49	0.42	-0.10	-1.13		1
398	-0.38	-0.96	0.06	-0.96		2
399	-0.31	0.45	-0.08	-0.90	RAINY RIVER 41	3
400	-0.82	-1.03	-0.16	-0.62		4
401	-0.24	-0.45	-0.17	-0.43		5
402	-0.33	-1.17	-0.14	-1.02		6
403	-0.29	-0.67	-0.12	-1.48		7
404	-0.26	-0.30	-0.15	1.00	RENFREW 42	1
405	-0.94	2.02	-0.13	2.52		2
406	0.21	-0.02	-0.20	1.36		3
407	0.27	-0.44	0.73	1.75		4
408	1.05	-1.51	0.05	0.40		5
409	1.32	0.19	-0.21	1.29	RUSSELL 43	6
410	0.50	-0.35	-0.07	-0.24		7
411	1.04	1.09	-0.19	0.73		8
412	0.13	-0.71	-0.24	0.77		9
413	0.41	-1.52	0.11	0.82		10
414	0.50	-1.66	-0.08	0.64	RENFREW 42	11
415	1.20	1.65	-0.15	1.51		12
416	0.57	-1.13	-0.06	0.25		13
417	0.43	0.05	-0.12	0.58		1
418	1.48	-0.45	0.10	0.66		2
419	1.62	-2.24	-0.11	1.12	RENFREW 42	3
420	1.43	0.71	-0.13	1.45		4
421	1.01	-0.50	0.17	0.18		5
422	-0.21	-0.32	-0.15	0.01		6
423	1.48	-1.20	-0.02	-0.19		7
424	2.91	-1.62	0.12	1.47	RENFREW 42	8
425	1.49	-1.13	-0.04	0.52		9
426	2.07	-0.79	-0.11	0.36		10
427	2.85	-0.30	0.15	0.99		11
428	0.86	-0.77	-0.16	1.43		12
429	0.91	0.64	-0.14	0.41	RENFREW 42	13
430	0.23	0.36	-0.06	0.21		14
431	-0.62	0.84	-0.11	0.15		15
432	1.40	2.51	-0.06	-0.80		16
433	2.70	0.20	-0.08	0.13		17
434	2.96	0.60	-0.07	1.64	RENFREW 42	18
435	1.71	1.98	-0.14	0.35		19
436	-0.01	0.17	0.08	-0.39		20
437	1.66	1.46	-0.13	-1.00		21
438	3.49	-0.74	0.29	2.70		22
439	-0.20	0.07	-0.00	0.87	RUSSELL 43	23
440	-0.26	-0.32	0.05	0.19		24
441	1.15	-0.96	0.09	0.85		25
442	-0.75	-1.37	0.09	0.81		1
443	-0.08	0.15	-0.05	0.75		2
444	-0.12	0.51	-0.05	0.54		3

OBSERVATION	FACTOR SCORES				COUNTY	MUNICIPALITY
	1	2	3	4		
445	-0.19	-0.26	-0.09	-0.12	SIMCOE 44	4
446	-0.03	0.23	-0.12	0.21		1
447	-0.15	1.81	-0.03	-0.67		2
448	-0.23	0.02	-0.03	-0.08		3
449	-0.59	0.58	0.01	0.72		4
450	-0.26	0.60	-0.05	0.00		5
451	1.04	-1.35	0.29	0.48		6
452	0.30	-0.18	-0.06	0.31		7
453	-0.37	0.07	0.06	-0.07		8
454	0.01	0.93	-0.02	2.96		9
455	-0.18	1.03	-0.11	0.33		10
456	-0.37	0.59	-0.07	0.46		11
457	0.27	0.45	0.03	0.47		12
458	-0.51	0.73	-0.06	0.26		13
459	0.00	0.55	-0.00	1.74		14
460	-0.43	1.26	-0.15	0.70		15
461	-0.74	0.73	-0.09	0.45	STORMONT 45	16
462	0.73	0.70	0.06	-0.12		1
463	-0.89	-1.08	-0.04	-0.50		2
464	0.12	-0.15	-0.04	-0.85		3
465	0.02	-1.10	0.17	-0.02	SUDBURY 46	4
466	0.60	1.63	-0.17	1.11		1
467	-0.58	0.82	-0.03	1.13		2
468	-0.49	1.37	0.02	0.38		4
469	-0.14	-0.40	-0.04	1.44		5
470	0.66	-0.62	0.12	1.22		7
471	0.46	1.35	-0.16	0.71		8
472	1.56	1.68	-0.14	0.66		9
473	-0.78	1.65	-0.12	0.41		10
474	0.45	0.49	-0.29	1.87		11
475	1.18	0.99	-0.05	-0.53		12
476	-0.08	1.59	-0.11	0.96		13
477	-2.11	0.05	-0.23	2.02		14
478	0.25	3.01	-0.11	-2.47		16
479	-0.33	-0.30	0.10	0.77		17
480	-0.76	1.35	-0.11	0.53	THUNDER BAY 47	19
481	0.01	-1.28	0.07	0.63		20
482	-0.57	1.21	-0.16	-0.16		1
483	0.01	-1.16	-0.17	0.57		2
484	-0.23	-0.69	-0.20	0.71		3
485	-0.64	-1.80	-0.06	0.40		4
486	-1.05	0.57	0.87	0.69		5
487	-0.51	2.23	-0.11	0.31		6
488	-0.74	1.18	-0.13	0.67		8
489	0.04	0.87	-0.09	0.81		9
490	0.28	1.94	-0.11	1.48		10
491	-0.12	-1.15	-0.12	-0.98		11
492	-0.64	-0.21	-0.11	0.43		12
493	-0.52	0.48	-0.04	0.69		13
494	-0.71	0.93	-0.14	0.67		14
495	0.16	0.67	-0.11	0.57		16
496	-1.00	1.23	-0.06	1.28	TIMISKAMING 48	17
497	-0.59	0.65	-0.06	0.86		1
498	0.43	-0.79	-0.10	2.70		2
499	-0.15	-0.36	0.06	0.99		3
500	-0.29	-1.02	-0.03	1.72		4

OBSERVATION	FACTOR SCORES				COUNTY	MUNICIPALITY
	1	2	3	4		
501	1.06	-2.07	-0.03	0.85		5
502	-2.39	-0.71	-0.07	2.54		6
503	0.37	-1.74	-0.09	-0.11		7
504	-0.30	0.51	-0.13	1.26		8
505	0.63	0.41	-0.17	1.14		9
506	-0.44	2.00	-0.19	1.27		10
507	0.93	-1.06	-0.22	1.09		11
508	0.21	0.76	-0.20	0.73		12
509	0.62	-0.27	-0.21	1.57		13
510	-0.65	0.11	-0.16	1.78		14
511	-1.45	-0.40	-0.14	1.29		15
512	-0.26	-1.27	-0.08	1.14		16
513	-1.73	-1.94	-0.17	3.74		17
514	-1.11	1.18	-0.01	2.47		18
515	-0.93	1.77	-0.07	2.12		19
516	-1.15	1.01	-0.00	2.67		20
517	-0.75	1.38	0.05	0.54		21
518	2.47	0.14	0.05	-0.59	VICTORIA 49	1
519	0.25	-1.57	-0.06	-0.95		2
520	1.31	0.59	-0.21	-0.35		3
521	0.28	-0.53	-0.11	-0.80		4
522	0.11	-0.30	-0.08	-0.65		5
523	0.24	-0.19	-0.12	-0.99		6
524	0.51	-1.81	0.12	-1.08		7
525	-0.41	-0.77	0.10	-0.19		8
526	-0.19	-0.11	-0.09	-0.75		9
527	0.34	-0.43	-0.09	-0.85		10
528	-0.10	-1.14	0.09	-1.11		11
529	-1.71	-0.72	-0.06	0.77	WATERLOO 50	3
530	-1.55	0.20	-0.03	0.16		4
531	-2.01	-0.09	-0.08	0.64		5
532	0.49	1.92	-0.01	-1.41	WELLAND 51	1
533	-0.16	0.97	-0.06	-0.09		2
534	0.10	1.68	-0.06	-0.29		3
535	0.19	1.74	-0.05	-0.94		4
536	-0.10	1.45	0.01	-0.54		6
537	-0.21	0.48	-0.09	-0.20		7
538	0.36	1.78	-0.06	-1.19		8
539	-0.99	-1.82	-0.01	0.12	WELLINGTON 52	1
540	-0.72	1.06	-0.12	-0.03		2
541	-0.51	0.13	-0.03	-0.27		3
542	-0.94	0.84	-0.11	-0.29		4
543	-0.30	2.36	-0.12	-0.83		5
544	-1.23	-1.54	-0.03	0.34		6
545	-1.37	-0.68	-0.11	0.25		7
546	-1.05	0.05	-0.13	0.54		8
547	-0.43	0.79	-0.06	-0.15		9
548	-1.72	-0.73	-0.14	0.95		10
549	-1.53	-0.71	-0.04	-0.07		11
550	-0.26	1.26	-0.14	-0.32		12
551	-0.67	-0.33	0.01	-0.76	(WENTWORTH 53)	
552	-0.14	1.00	-0.04	-0.34	YORK 54	2
553	-0.36	0.50	-0.02	-0.67		3
554	-0.47	1.55	-0.08	-0.04		4
555	0.02	1.02	0.06	-1.03		5

NOTE: Factor 1: "Rural Farm Poverty"

Factor 2: "Rural Non-Farm Poverty"

Factor 4: "Social Disadvantage"

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