Residents' Images of Northern Canadian Resource Communities

by

Alison Margaret Gill

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A thesis submitted to the Faculty of Graduate Studies of the University of Manitoba in partial fulfillment of the requirements of the degree of

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ABSTRACT

The general objective of the research is to examine the dimensions of residents' images of northern Canadian resource communities. The selected study communities are Thompson and Leaf Rapids in northern Manitoba. The specific objectives are to examine how dimensions of the image are related to: (i) present and past community environment; (ii) length of residence; (iii) differences in sex and marital status. Hypotheses are formulated on the basis of these objectives.

Data concerning the nature of the image are elicited by administering a questionnaire to Thompson and Leaf Rapids residents. The questionnaire includes response formats developed within the framework of repertory grid methodology. The data are collected from random samples of heads of households, or their spouses, in the two study communities. The hypotheses are tested using principal components analysis and multidimensional scaling. The findings indicate that distinct group images are identifiable on the basis of each of the selected variables that are tested. The implications of the results for the design of northern resource communities are examined, and suggestions are offered for further related research.

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CONTENTS

Appendix page

LIST OF TABLES

LIST OF FIGURES

Chapter I

INTRODUCTION

1.1 OBJECTIVES OF THE RESEARCH

The general objectives of the research are:

1. to examine the dimensions of residents' images of selected northern Canadian resource communities;
2. to investigate the factors that influence the formation of these images.

High rates of population mobility characterise northern resource communities, creating social and economic problems for community planners and employers[1]. From the perspective of behavioral geography, an examination of residents' subjective images of places is a central focus in attempting to understand migration behavior. In this thesis, selected attributes are examined to determine their influence on the images of two resource communities in northern Manitoba, Thompson and Leaf Rapids. The specific objectives of the thesis are:

> (1) to determine how the dimensions of images of northern resource towns are related to community environment

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[1] In the present context, a northern resource community refers to a community located north of the contiguous zone of agricultural settlement in which the primary economic activity is resource extraction.

(2) to determine how the dimensions of images of northern resource towns are restructured as a result of length of residence

(3) to determine how the dimensions of images of northern resource towns are related to differences in sex and marital status.

The following hypotheses are developed on the basis of existing theory and empirical work in accordance with these objectives.

The hypotheses concerning community environment are:

Hypothesis 1:

that the dimensions of residents' images of Thompson and Leaf Rapids are related to community environment;

Hypothesis 2:

that the dimensions of residents' images of northern resource communities are influenced by the size and location of the communities in which they were born and raised;

The hypotheses concerning length of residence are:

Hypothesis 3:

that short-term residents' images of northern resource communities are related to personal aspirations rather than community related factors;

Hypothesis 4:

that longer-term residents' images of northern resource communities are predominantly structured in terms of community related factors;

The hypothesis concerning differences in sex and marital status is:

Hypothesis 5:

that the images of northern resource communities are related to the residents' sex and marital status.

The hypotheses are tested within the general framework of personal construct theory (Kelly, 1955). Personal constructs are elicited from small samples of residents in the two study communities, providing the basis of a rating grid on which a larger sample of residents evaluate their communities. Additional information is obtained from the larger sample concerning their socio-economic characteristics, past migration behavior, and preferences for selected communities. Descriptive statistics, principal components analysis, and multidimensional scaling are used to test the validity of the hypotheses.

1.2 ORGANISATION OF THE THESIS

In the remainder of Chapter 1, the terms and concepts in the multidisciplinary field of man-environment relations are clarified. A conceptual framework for the present study is then discussed. Chapter 2 offers a discussion of pertinent literature. The discussion is divided into two sections concerning (1) the environmental image and (2) studies of northern resource communities. The contribution of the present study to these bodies of literature is then considered. Chapter 3 presents a more detailed examination of the objectives of the thesis and the derivation of related hypotheses. In the latter part of Chapter 3, there is a discussion of repertory grid technique, one of the major methods employed to test the hypotheses. In Chapter

4, the study area is described and the data collection procedures are discussed. The latter includes consideration of the sampling design, and the questionnaire formulation and administration. Chapters 5 and 6 both focus on the results of the data analysis. In Chapter 5, descriptive data on the profile characteristics of the sample are first presented and followed by the results of the tests of Hypothesis 1 which relates to the present community environment. Chapter 6 presents the results of the analysis of the remaining four hypotheses which concern previous residential experience, length of residence, and differences in sex and marital status. Finally, a summary of the main conclusions of the research is outlined in Chapter 7 and suggestions are offered for future research.

1.3 BEHAVIORAL GEOGRAPHY

During the past twenty years, a significant amount of research conducted within the social science disciplines has focused on the field of man-environment relations. These studies have assumed a distinctive character with contributions from psychology, geography, sociology, anthropology, architecture and urban planning. Despite parallel developments among these disciplines, a distinct unified field of enquiry has not fully developed. Instead, researchers have generally tended to adhere to their parent disciplines (Lee, 1976) and, as a result of these diverse

approaches, confusion has arisen concerning relevant terminology and conceptualisation. A variety of names has been proposed to encompass the new field but none has been commonly adopted. The term environmental psychology is the most widely used due to the heavy reliance on psychological methodology and concepts. Within geography, however, the subdiscipline is variously referred to as environmental perception (Saarinen, 1976), cognitive-behavioral geography (Harvey, 1969), or behavioral geography (Gold, 1980). In the present study the latter term is employed. As Gold (1980, 4) indicates,

> 'behavioural geography' may be regarded as the most common name for that part of geography that adopts the behaviouralist approach to man-environment relationships, where explanation of spatial patterns of behaviour is sought primarily in cognitive processes that underpinned that behaviour.

In this section, definitions of terminology pertinent to the present study are first outlined in order to clarify the subsequent discussion of relevant conceptual approaches. These approaches are then briefly reviewed as a basis for presenting the conceptual framework of this study.

1.3.1 Definitions

The term environmental perception has been most commonly adopted by geographers to identify those studies which emphasise the role of the mind as the intervening variable between man and the environment. The geographer's use of

this term differs from that of the psychologist. Specifically, perception when applied by psychologists usually refers explicitly to the input of stimulus information to the brain through the various sense receptors of sight, sound, touch, smell and taste. Geographers, however, commonly use the term in a much broader sense to include cognition. Cognition as defined by Neisser (1967, 24) consists of, "all processes by which the sensory input is transformed, reduced, elaborated, stored, recovered and used". Cognition is thus used as the broader term which sometimes is considered to include the cognitive process of perception. Proshansky et al. (1970) argue that the distinction between perception and cognition is not meaningful in terms of large-scale environmental phenomena. Gold (1980, 20) adds that the distinction should be seen as "a heuristic device rather than a fundamental dichotomy". These largely semantic arguments remain unresolved. In the present study, the term perception is used in the more limited manner to indicate the input of stimulus information to the brain, while cognition refers to the organisation and use of the perceptual information in conjunction with stored information.

The term environment (as used in the terms environmental perception and environmental psychology) also requires clarification. In common usage it is frequently taken to mean the physical environment, although psychologists often

use this term to infer the social environment. In the study of human environmental cognition and behavior, environment must be considered in a broader sense. Pocock and Hudson (1978, 19) suggest that the environment includes, "anything external to the perceiver which influences or might influence the perception process". Craik (1968) suggests that the term environmental display be used to describe the factors which influence man's behavior. Such factors include all aspects of the natural and man-made physical environment in addition to social and cultural components. Sonnenfeld (1972) suggests that behavior is a response to a hierarchically nested set of environments. The most inclusive is the geographical environment which is the entire world, while the smallest environment is the behavioral environment or that part of the environment that elicits a specific behavioral response from an individual.

Central to the present study, and indeed to any investigation of man's behavioral response to the environment, is the concept of the image. The application of the term by geographers has largely been derived from Boulding's (1956) initial conceptualisation of the image as subjective knowledge. The image is viewed as a filter between man and the environment. As a result of everyday contact with the environment, individuals develop stable and consistent images which provide the basis for behavior. The term image is used consistently in the present study to

imply the product of both perceptual and cognitive processes and is composed of designative, evaluative, and affective aspects[2] (Pocock and Hudson, 1978). This definition is broader in scope than the traditional concept of the image held by psychologists who define image as "sensory-like experiencing which occcurs in the absence of appropriate sensory stimulation" (Hunter, 1957, 184). Other terms used by researchers more or less synonymously with image include, mental map (Downs and Stea, 1977), cognitive map (Downs and Stea, 1973), and spatial schema (Lee, 1968). The term mental map is particularly confusing as this term has also been used more specifically to refer to sketch maps drawn by respondents showing areas of familiarity within the city (e.g. Porteous, 1977; Burgess, 1978), and to describe both the graphic and verbal interpretations of residential preferences (Donaldson, 1973; Donaldson and Johnston, 1973; Gould and White, 1974)[3]. In the latter context, the term space preference is used in the present study instead of Gould's (1966) term mental map. Burgess, in an attempt to clarify the use of these terms, suggests that the terms cognitive map and mental map should be used to describe

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[2] A fuller definition of the image in the conceptual framework is presented in the subsequent section of Chapter 1.

[3] Golledge (1981, 1337) comments, however, that "only researchers ignorant of the mainstream of behavioral research in geography would continue to perpetrate the confusion of concepts of mental maps and preference surfaces that developed in the 1960s".

sketch map representations of the environment, while the image should be used to "characterise the verbal descriptions of individual experiences, feelings and attitudes towards the environment" (1978, 4).

1.3.2 Conceptual Approaches

As a result of the disparate aims of psychology and geography, there are varied approaches to the study of man-environment relations. Pocock and Hudson (1978, 20) summarise the differences as follows:

> the geographer is involved in the man-environment relationship in order to better understand man's use of, or behavior in the environment. The psychologist on the other hand studies the field from the point of view of man and his psychological processes in order to explain how the environment is known.

Bunting and Guelke (1979) suggest that the common theoretical framework for studies in environmental perception both in geography and in the other disciplines is cognitive behaviorism. This premise is "based on the assumption that man reacts to his environment as he perceives and interprets it through previous experience and knowledge" (Bunting and Guelke, 1979, 449). This approach lies between the two traditionally conflicting models of man held in psychology by the behaviorists (e.g. Tolman, 1932; Skinner, 1938), and the phenomenologists (e.g. Köhler, 1929; Koffka, 1935). The behaviorists view man as a passive organism governed by external stimuli whose behavior can

thus be examined in a stimulus-response framework. The scientific method is used to study behavior with the purpose of establishing causal laws. Phenomenologists, whose views are based on Gestalt theory, see man as free to choose in every situation. Relph (1970 195) states that, "image is viewed as reality and thus the source of behavior is subjective experience". Their view is holistic in approach and focuses on the individual's experience of environmental phenomena. Ericksen (1976) argues strongly that geographic studies of behavior do lie between these two extremes. The majority of geographic studies in the field employ the scientific method and examine aggregated responses in an attempt to achieve nomothetic results (Ericksen, 1976). However, unlike behaviorists who ignore the mental processes, behavioral geographers consider cognitive processes as a central focus. A few geographers do lean heavily towards phenomenology (e.g. Lowenthal, 1961, 1962; Relph, 1970, 1976; Tuan 1974, 1977) in studies which relate to the affective aspect of the image such as the sense and symbolism of place.

A basic conceptual schema for geographical research in man-environment relations is presented by Downs (1970a, 85). This framework incorporates the basic propositions and concepts used by geographers in behavioral work and has frequently been quoted and adapted by other authors (e.g. Ericksen, 1976; Saarinen, 1976). Information from the real

world (the environment) is viewed as entering the mind through a system of filters. These consist of the physiological filters (i.e. the sense receptors) and other filters relating to psychological, cultural and social contexts. Information is next incorporated into the image which already contains memory data based on past experiences. The image is characterised by three interrelated aspects: (1) designative; (2) appraisive; (3) prescriptive (Pocock, 1973). The designative aspect is concerned with the basic descriptive properties of the environmental image. Elsewhere, this is referred to as the structural aspect (Burgess, 1978; Hansvick, 1978). The appraisive aspect is concerned with evaluation, which includes preference. The prescriptive aspect relates to prediction and inference, and is based on "the sum of experiences of similar situations, ... inferential structuring from the inherent laws of organisation, and thirdly, perhaps logic and faith" (Pocock and Hudson, 1978, 30).

In response to the image, the individual may be required to adjust himself with respect to the real world. This requires a decision which may result in either an overt behavioral response or a search for further information. The process is cyclical and dynamic as the overt behavioral response may change aspects of the real world. As Ericksen (1976, 21) states, "the central point of the dynamic

process.....is that behavior is some function of an image of the environment: a mental construct".

1.4 CONCEPTUAL ORGANISATION OF THE STUDY

The central focus of the present study is the examination of the environmental image and the factors which affect its formation (Figure 1). Specifically, the community images of residents in northern Canadian resource towns are examined. Information from the environment enters the mind by means of perception. Residents acquire most of their information about the community in which they live from direct sources such as sight, sound, and smell. They may also acquire information from indirect sources such as the media and other people. Frequently, at the evaluative stage of decision-making, the environmental information concerning other places of potential residence (against which one assesses the place utility[4] of the present residence) is obtained indirectly. Information from the environment is adjusted by each individual using a set of personal filters which reflect social, cultural, and psychological characteristics. These filters are especially important in the formation of values and attitudes which are applied by the individual to appraise environmental information.

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[4] See Chapter 2, pages 26-27, for a further discussion of place utility.

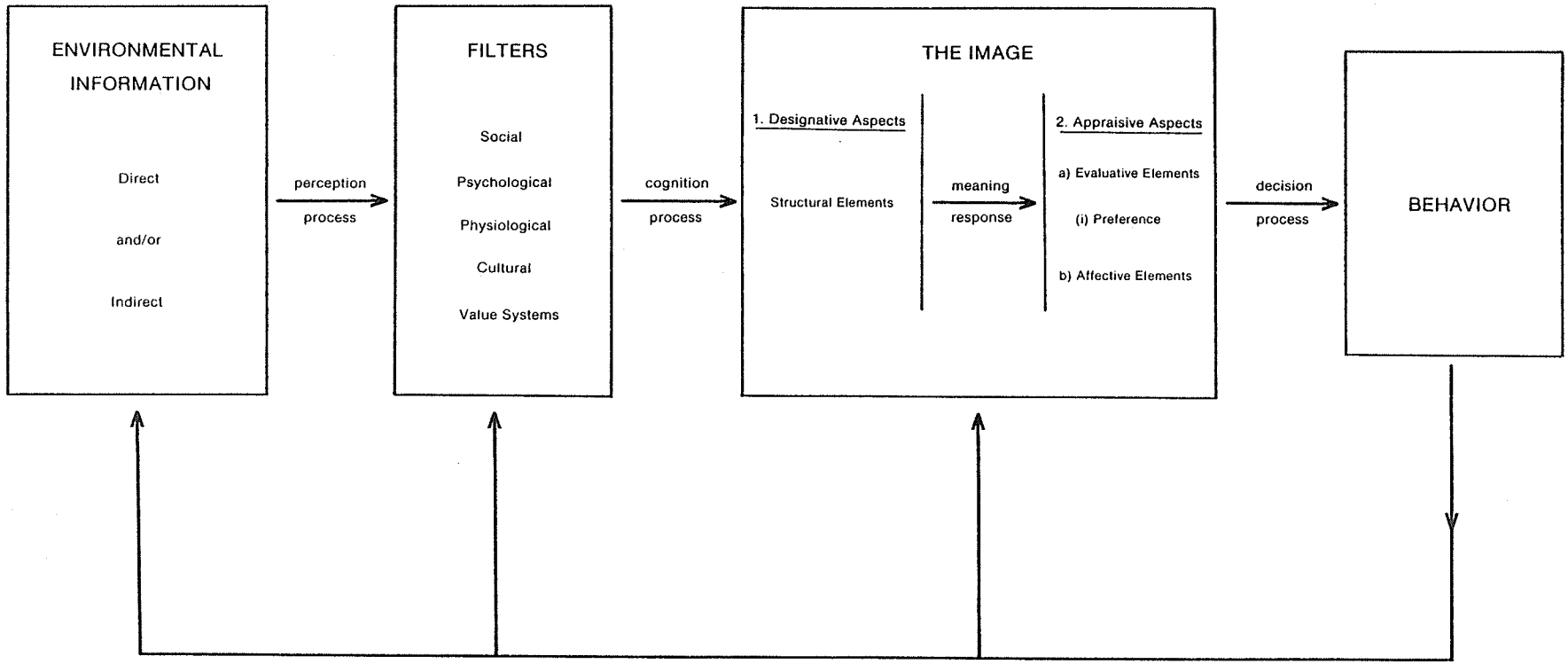

Figure 1. Conceptual Model of the Image in the Framework of Man-Environment Relations

In this study three characteristics (or filters): length of residence, sex, and marital status are considered to be especially pertinent social variables in the context of northern resource towns, and their role in image formation is assessed. It is also contended that information is organised with reference to past experience to produce the image. The relevance of previous places of residence as frames of reference, notably place of birth and upbringing, are specifically examined in the study. For convenience of examination, two aspects of the image can be identified (1) designative and (2) appraisive aspects, although in reality these distinctions are not sequentially definable. Designative aspects consist of the descriptive elements of the image and their relationships to the real world are dependent on the quantity and quality of information available. The appraisive aspects of the image result from the attribution of subjective meaning to the designative aspects. Two elements of the appraisive aspect can be identified (a) evaluative elements; and (b) affective elements. Affective elements of the image refer to the deep emotional feelings such as a person's sense of place and symbolism in the environment. Affective elements are not considered in detail in the present study. Instead the work focuses on the evaluative elements which are relative in nature and must be considered within a frame of reference. In evaluating place utility, for instance, the environmental

attributes of one's present residence are assessed with reference to other places. Places of previous residence obviously play a significant role in this assessment. A major objective of the study is to assess the significant attributes of place evaluation. A subset of evaluation is preference, which is often a necessary construct if a decision is to be made. In this thesis, preference refers specifically to evaluative assessments which incorporate rank-order judgments[5]. In the present study, preference is examined separately from evaluation and focuses specifically on place preferences, which relate in turn to migration decision-making. Consideration is given to preference structuring of residents, but the consequent overt behavior is not considered.

1.5 SUMMARY

The stated objectives of the research are to examine the dimensions of residents' images of northern Canadian resource towns, and to investigate selected factors which may influence the nature of these images. Hypotheses are formulated in accordance with these objectives. Community differences, length of residence, residential experience, and differences in sex and marital status are all

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[5] Hourihan (1979, 1356), elucidates the nature of preference, stating that, "the modern approach to understanding preferences involves relating them to the perceptual-cognitive information which people have of the stimulus domain in question".

hypothesised as significant variables which affect the character of the community image. The meaning of terms employed in the field of behavioral geography is clarified, and the place of the study within a general conceptual framework is articulated.

Chapter II

REVIEW OF LITERATURE

The research pertinent to this study falls into two general sections:

1. studies concerning the nature of the environmental image;
2. studies concerning resource communities in northern Canada.

The relevant research is therefore reviewed within these sections. The contribution of the present study to this body of literature is then outlined.

2.1 THE ENVIRONMENTAL IMAGE

Most research concerning the environmental image has been conducted during the past twenty years. The findings are disparate and interdisciplinary in nature[6]. An important distinction can be made between the earlier studies which generally focus on the structural (or designative) aspects of the image and more recent studies which are more concerned with the appraisive (or meaning) aspects. In this

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[6] Several general overviews of the research exist including those by Downs and Stea (1973), Ittelson et al. (1974), Saarinen (1976), Porteous (1977), Gold (1980). A recent report by Saarinen and Sell (1980) provides an update of current work in the field.

section, the techniques and findings of research on the designative aspects of the image are first reviewed. The subsequent section on the appraisive elements of the image is more extensive as it has greater relevance to the present study. The section concerning the appraisive aspects is subdivided into two parts:

1. a general overview of research concerning the appraisive aspect of the image with particular emphasis on the techniques employed;
2. an examination of the findings of those studies relating specifically to the evaluation of places.

2.1.1 Designative Aspects of the Image

The designative aspects are described by Pocock and Hudson (1978) as the "whatness" and "whereness" of the environmental image. These aspects are informational in character concerning basic properties such as distance, orientation, location, and spatial variation. The earliest and most influential work on urban imagery was Lynch's The Image of the City (1960). This represents the first attempt to operationalise Boulding's (1956) concepts concerning the image[7]. The most significant contribution of the work is the seminal influence that it has had on later research. Specifically, Lynch's work has provided both methodological and conceptual direction within the emerging

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[7] Boulding's concepts are discussed in Chapter 1.

multidisciplinary field of man-environment relations. A significant criticism of Lynch's technique concerns the extent to which cartographic ability rather than cognitive structure is measured. Further, while recognising that the environmental image is comprised of three components: identity, structure, and meaning, Lynch nevertheless excludes the meaning component from his study, suggesting that it is too complex and idiosyncratic to be included (Lynch, 1960, 9)[8]. The central focus of his work on urban imagery is to examine the "legibility" or visual clarity of the urban landscape. In Lynch's attempt to measure the "public images" of residents in Boston, Jersey City and Los Angeles, interview survey respondents were required during an interview to draw a sketch map of the city. In addition, they listed and briefly described the parts of the city they felt to be most distinctive. On the basis of his comparison of responses, Lynch suggests that group images of the city are organised around five major sets of elements: paths, edges, districts, nodes, and landmarks. The cognitive mapping techniques developed by Lynch have frequently been employed to define individual and group differences in the image, and to investigate the nature of relevant explanatory variables. Moore (1979) categorises these variables as (1) external environmental factors and (2) internal organismic

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[8] Burgess (1978) comments that the exclusion of connotative meaning flaws Lynch's work and notes that this aspect has subsequently continued to be neglected by researchers.

factors. He notes that the former group is one of the least explored set of variables. However, some early work on cognitive mapping emphasises the importance of physical form on image development. In a study of towns in the Netherlands, de Jonge (1962) concludes that image formation is facilitated where a regular street plan, a single dominant path, characteristic nodes, and unique landmarks occur. Lowenthal and Riel (1972) have also emphasised the importance of the environment in determining the image. For example, their study of four English towns indicates that the most cohesive images are produced by residents of towns with hilltop views. The importance of paths in the formation of a cohesive image has also been recognised by many researchers (e.g. Appleyard et al., 1964; Carr and Schissler, 1969; Golledge and Zannaras, 1973). At an architectural level, however, Appleyard (1970) found that functional use was of greater significance than visibility or physical form.

A variety of socio-economic variables has been tested to determine their relationships with attributes of the environmental image[9]. Klein's (1967) work in Karhlsruhe, Germany, represents an extensive study of over 1000 residents to discover whether social status and place of residence influence their conception of the town center. All residents recognised a coherent central area but their

[9] Only those of relevance to the present study will be reviewed.

spatial definitions varied. For example, increased length of residence resulted in a more extensive definition of the town center. Klein also discovered that those living in or near the town center had a more restricted image of its extent than suburban residents. A study of Chicago's Loop (Saarinen, 1969) reveals that all respondents identify the general street pattern and major landmarks. However, those working in the Loop are found to have a more detailed and spatially limited image than students whose main activity nodes are located outside the Loop.

Appleyard's (1970) study of residents in the new town of Cuiiad Guyana, Venezuela, suggests that length of residence appears to be one of the significant variables for explaining group differences in the image. Newcomers were found to produce predominantly sequential sketches and their maps were more restricted in area than longer-term residents[10]. However, residents of six to twelve months had fewer errors than longer-term inhabitants, which Appleyard interprets as revealing a higher level of interest and concern on the part of the former. Moore's (1975) findings support Appleyard's contention that familiarity results in a shift from sequential cognitive maps to spatial cognitive maps. These findings further emphasise the significance of paths, especially in the formative stages of environmental

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[10] Appleyard (1970), identifies "sequential" elements of cognitive maps as consisting primarily of roads, whereas "spatial" elements include landmarks, districts, and nodes.

cognition. The effect of length of residence on the image is also examined by Porteous (1971) in a study of Ellesmere Port, England. Two separate public images are clearly revealed, one held by migrants relocated from Liverpool and one held by long-term residents. New residents emphasised such highly legible elements as the automobile factory and the oil refinery, while they ignored the details of the urban core which were familiar to the long-term residents. The learning process of new residents is examined in a study of the wives of naval officers who had recently moved to Idaho Falls, Idaho (Devlin, 1976). Changes are revealed in maps drawn at three month intervals. Initial maps drawn after only three weeks residence emphasise paths as the dominant elements, while later maps strongly focus on landmarks of functional significance. These results appear to corroborate those of Appleyard (1970) concerning a shift from sequential to spatial cognitive mapping.

In the present study the two selected social variables are sex and marital status. There are few studies which focus specifically on these variables although Everitt and Cadwallader (1972, 1981) do examine differences in cognitive mapping between men and women. They conclude that women conceive of a larger immediate territory as home area than men. In addition, women have more detailed imagery of their immediate surroundings, while men have a more composite image of the city as a whole.

In the present study cognitive mapping techniques are not employed. However, findings of the research employing these techniques have significance concerning the examination of designative aspects of the image. Length of residence and differences in sex have been shown to affect the nature of the image and the present study examines these factors further. In addition, environmental factors (which Moore (1979) considers to be the least explored set of variables) are also examined[11].

2.1.2 Appraisive Aspects of the Image

Pocock and Hudson (1978) suggest that the designative aspects of the image may be less important than the appraisive aspects, which are concerned with the meaning attached to, or evoked by, physical form. Since the early 1970's there has been an increasing number of researchers considering appraisive aspects of the image. Verbal response formats are employed, and researchers suggest that they provide a more suitable method of examining the complex nature of the image than cognitive mapping techniques (e.g. Lowenthal and Riel, 1972; Francescato and Mebane, 1973; Hudson, 1974; Burgess, 1978). The appraisive aspects of the image consist of both evaluative and affective elements. The evaluative elements include not only evaluation per se

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[11] Environmental factors include both the physical and human aspects of the environment within which an individual operates.

but also preference, which is a subset of evaluation (see Section 1.4). The affective element concerns the emoticnal response to the environment and is of less relevance to the present study. Therefore, in this section a general overview of studies relating to the appraisive aspects of the image is first presented. The techniques employed in examining the appraisive aspects of the image are emphasised since these are more relevant to the present study than the specific findings. The discussion then focuses specifically on the findings of research relating to the evaluation of places.

2.1.2.1 Techniques of Examining the Appraisive Aspects

One of the most frequently used psychometric techniques employed to examine the environmental image is the semantic differential rating scale[12] (Osgood et al., 1957). In an environmental context, studies employing the semantic differential subsume a wide variety of problems which, for example, include an examination of the attributes of shopping centers (Downs, 1970b), environmental hazards (Golant and Burton, 1970), urban stereotypes (Burgess, 1974), urban walks (Lowenthal and Riel, 1972), and landscape evaluation (Zube, 1974).

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[12] A discussion of the semantic differential technique is presented in Section 3.3.

An alternate method of examining the meaning component of the image is the application of the repertory grid technique (see Section 3.2). This technique was originally applied in the field of clinical psychology and is based on the theory of personal constructs (Kelly, 1955). It is preferred by some researchers to the semantic differential because the rating scales are not preselected by the researcher and should therefore be more relevant to the respondent's mental construction of environmental elements. Harrison and Sarre (1971) were among the first to apply the repertory grid technique in a geographical context. Their study of images of the city of Bath, England, reveals problems concerning the feasibility of aggregating individual responses when using the technique (Harrison and Sarre, 1975). In addition, a study by Hudson (1974) examining the learning process associated with students' cognition of grocery stores, draws attention to the large amounts of interview time required when using the repertory grid, thus restricting the sample size. However, Lieber (1978) did succeed in adapting the technique by using a mail questionnaire to examine the migration intentions of 421 university students in Iowa. Other applications of the technique include studies of residential preference (Silzer, 1972; Preston and Taylor, 1981a; 1981b), the time component in image construction (Tranter and Parkes, 1979), cross-cultural differences in image of tropical rainforest

(Townsend, 1977), and recreational preferences (Palmer, 1978).

Although the semantic differential and repertory grid methodology have been among the most widely used verbal response formats in image elicitation, a variety of other methods is employed as alternate or supplemental means of obtaining responses. These include such methods as adjectival checklists (e.g. Craik, 1968; Palmer et al., 1977; Burgess, 1978), free association tests (e.g. Desbarats, 1976; Burgess, 1978), Likert-type scales (e.g. Gustavus and Brown, 1977; Smith and Alderdice, 1979), and thematic apperception tests (e.g. Sonnenfeld, 1967; Saarinen, 1973). In studies specifically relating to preference, data are elicited in the form of rank-orders (e.g. Gould, 1966) or paired comparisons (e.g. Demko, 1974).

Responses elicited using the verbal response formats described above are usually statistically analysed to reveal the underlying factors or dimensions which comprise the image. The semantic differential is specifically designed for factorial analytic techniques which are frequently applied to rating scales (Osgood et al., 1957). The principal components solution has been the most commonly applied technique in the analysis of both the semantic differential and repertory grids (e.g. Downs, 1970b; Golant and Burton, 1970; Harrison and Sarre, 1971; Townsend, 1977). This is in part due to the high levels of communality in

environmental data which frequently preclude the use of other factoring methods.

Recently, multidimensional scaling (MDS) techniques have been applied in studies of the environmental image (see Section 5.2.3.2). Burnett (1973) was one of the first to apply this methodology in a geographical context when she examined the dimensions of consumer decision-making in Sydney, Australia. Several studies have also employed the technique to examine residential preferences (Rushton, 1969; Demko, 1974; Lloyd, 1976; Hansvick, 1978). The advantage of the technique lies in the unbiased nature of the input, although interpretation of the dimensions is often difficult and very subjective. Palmer (1978) suggests the incorporation of repertory grid methodology to help resolve this problem. In a study of recreational locations in England, he elicited constructs from respondents which are then utilised in the interpretation and labelling of the dimensions, thereby reducing subjectivity.

The techniques of examining the appraisive aspects of the image that have been described so far are all positivistic in nature. Saarinen and Sell (1981, 531) comment that much of the work of behavioral geographers, "involves selection of concrete, easily measurable units of analysis but neglect of the abstract, symbolic or elusive items like feelings or sentiments". However, they concede that a strong humanistic upsurge has characterised the more recent work in

environmental perception. Several geographers have focused on these affective elements of the image. Of particular note is the work of Tuan (1974, 1975, 1977) and Relph (1970, 1976) on the meaning of place, and Lowenthal and Prince (1964, 1965) on landscape aesthetics. Relph (1970) expresses the extreme phenomenological view that the image is reality and can only be studied through individual experience. Thus, phenomenological studies employ description and interpretation of individual experience as the basis of their assumptions (e.g. Symanski, 1980). Humanists have focused predominantly on philosophical interpretations of man-environment relationships (e.g. Tuan, 1977; Relph, 1976, 1981; Seamon, 1979). While recognising the need to acknowledge that a "spiritual component" (van der Laan and Piersma, 1982) is present in man's image and subsequent behavior, humanistic concepts are difficult to incorporate in any applied or problem-solving context.

2.1.2.2 Evaluation of Places

The evaluative element of the environmental image has received particular attention in studies which attempt to find links between the image and spatial behavior (e.g. Demko, 1974; Lloyd, 1976). Many of the studies relating to the evaluation of places have been within the context of migration decision-making (e.g. Gustavus and Brown, 1977; White, 1977). Of less significance to the present study is

work relating to recreation or consumer decision-making (e.g. Hudson, 1974; Palmer, 1978). Work concerning the evaluation of places can be categorised into two groups:

1. place utility studies which attempt to uncover the significant dimensions employed by individuals in their evaluation of places;
2. space preference studies which focus on the preference ratings of places.

The concept of place utility was introduced by Wolpert (1965) in his seminal model of the migration decision-making process of individuals. Place utility is defined as, "the net composite of utilities which are derived from the individual's integration at some position in space" (Wolpert, 1965, 162). This definition emphasises the fact that the origin and destination points of migrants take on significance only in the framework within which they are evaluated. Wolpert (1965) did not empirically test his model of migration but subsequent attempts were made to operationalise his concepts. For example, Brown and Moore (1970) proposed a conceptual framework of migration decision-makng in an intraurban context which was later also tested at an interurban scale (Brown et al., 1977). The relocation decision is viewed as consisting of two collateral activities: search and evaluation (Brown, et al., 1977). Migration is seen as a process of adjustment in which one town of residence is substituted for another to

better satisfy the needs and desires of the individual as a result of increasing the place utility.

Various studies attempt to identify the dimensions along which place utility is assessed. Demko (1974) examines the evaluation of southern Ontario cities in a migration decision context. Employing MDS techniques he finds support for the general hypothesis that once some basic level of economic satisfaction is reached, attention will shift to non-economic factors such as social and environmental concerns. Although Desbarats (1976) does not examine the structuring of the environmental image in the context of residential evaluation, she reveals that functional or economic attributes of California cities are of less importance in structuring of mental images than the climatic and environmental dimensions.

Lueck (1976) emphasises that many of the studies relating to residential desirability focus on aggregate place attributes, while migrants are more concerned with evaluating particular opportunities such as jobs, college openings or retirement housing. The study by Gustavus and Brown (1977) in Columbus, Ohio, represents an attempt to identify specifically those individual attributes which are important in assessing place utility. Using a variety of response formats to elicit responses, they examined the significance of thirteen different attributes[13]. The

[13] Housing, jobs, schools, entertainment, recreation, friendliness of the community, cost of living, police and

respondents were comprised of recent migrants to Columbus. They were first asked to indicate their satisfaction with each of the attributes in the context of (1) Columbus, (2) their previous place of residence, and (3) their second choice of migration destination. Gustavus and Brown conclude that all the attributes are of some relevance in the decision-making process, although "a good job" and "a nice house" emerge as the most important. When the same thirteen attributes were presented in the form of trade-offs among which respondents had to make a choice, however, different findings were obtained. Specifically, good health care facilities emerge as the attribute which the migrants consider most essential. The "city-lights" type of urban amenities such as entertainment, recreation and shopping, on the other hand, are readily traded off for other attributes.

Place utility can only be assessed in relation to a person's action space. Action space is defined as, "those places about which respondents have enough knowledge to make a residential preference evaluation" (White, 1977, 47). The term is broadly synonymous with the concept of awareness space as defined by Brown and Moore (1970) whose two component elements are: (1) activity space which is comprised of those places with which the migrant has direct contact as a result of past activities, and (2) indirect contact space which includes those locations about which an

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fire protection, kind of people, welfare, nearness to home, shopping and health care.

individual has knowledge as a result of second-hand contact through such sources as acquaintances and the mass media.

Most research into action space/awareness space has focused on intraurban migration (e.g. Adams, 1969; Brown and Moore, 1970; Horton and Reynolds, 1971). However, White (1977) suggests that action space may also be a valuable construct for analysing interurban migration. He investigated residents in various Kentucky cities to determine preferences, knowledge, and attitudes about their home town and selected survey cities. White attempts to link this cognitive information with observed migration behavior. He concludes that action space reflects observed patterns of migration more accurately than such commonly used indicators as economic factors and distance. On the other hand, Brown et al. (1977) find that the likelihood of a town being included in an individual's awareness space is directly related to the size of the town's population and inversely related to the distance from the individual's place of residence. These results merely substantiate traditional gravity model theories of migration behavior (e.g. Zipf, 1946). However, on a more subjective level Brown et al. (1977) find that a person's familiarity with a place, especially as a result of personal contact, contributes to its attractiveness as a potential migration destination.

Various factors have been shown to influence an individual's evaluation of places. Emphasising the relative nature of place utility, studies by Wohlwill and Kohn (1973, 1975) reveal significant differences in the evaluation of communities among recent migrants according to the size of the previous community in which they lived. Wohlwill and Kohn conceptualise this in a framework based on the adaptation-level theory developed by Helson (1964). Helson hypothesises that adaptation level, which determines an individual's evaluation of stimuli, is a function of three classes of variables: focal, contextual, and residual. The first refers to the object of judgment, the second to the background stimuli in the individual's perceptual field at the time of judgment, and the third to previous experience with comparable stimuli. This residual stimuli is therefore synonymous with the frame of reference which is developed from previous residential experience (Wolpert, 1965). However, Preston and Taylor (1981b) find no evidence, in a study of Hamilton, Ontario residents, to support a relationship between residential experience and cognition.

Other researchers have also considered the size of a community as a significant variable in place utility studies (e.g. Demko, 1974; Blackwood and Carpenter, 1978). Size has been used as a surrogate for certain quality of life attributes (e.g. levels of urban amenities) of communities. Demko (1974), in his study of southern Ontario cities found

that respondents expressed a preference for intermediate-sized cities as potential migration destinations. Blackwood and Carpenter (1978) found a similar preference for non-metropolitan towns in Arizona.

Other variables which affect an individual's evaluation of place include socio-economic attributes. Stage in the life cycle has been considered one of the most significant sociological determinants affecting a person's residential needs and aspirations, and thus one's evaluation of towns or dwellings (Troy, 1973; Preston and Taylor, 1981a, 1981b). Rossi (1955) has estimated that five of the eight residential moves made by the average American family are due to changing family composition. This has been substantiated further by other researchers (e.g. Abu-Lughod, 1960; Simmons, 1968).

In work concerning cognitive aspects of migration decision-making, the ultimate goal has been to develop links between the image and behavior. This has been especially true of that subset of place evaluation research which focuses on space preferences. Gould (1966), who investigates space preferences in his work on <u>mental maps</u>, indicates that an objective of the research is to link preference and overt behavior in a particular behavior setting. In a series of studies, Gould and various co-authors (Gould, 1966, 1967, 1969, and Gould and White, 1968) have investigated students' preferences by requiring

them to rank various areal units (e.g. American states or British counties) in terms of residential desirability. Based on these preference data, isoline maps were constructed showing the relative desirability of various areas. A recurrent observation is the *local dome effect* which reflects the tendency for people to favor locations close to their present residence. This finding is consistent with other work on migration decision-making which indicates that the greater quantity and quality of information available about nearby locations increases their preference ratings due to the reduction of uncertainty (Brown *et al.*, 1977).

Questions concerning the validity of Gould's technique have been raised with reference to the ability of respondents to consistently rank-order large numbers of places. Research into space preferences has also been criticised for a failure to consider the variables which underlie preference judgments (Rushton, 1969). However, some attempts have been made to consider certain causal variables. Johnston (1971) focuses on the effect of socio-economic status as a factor influencing the residential preference ratings of students in Christchurch, New Zealand. He found the preferential ranking of residential areas to be positively correlated with opinions about their social standing. A similar study by Silzer (1972) in Toronto attempts to evaluate further the bases of

preference by using the repertory grid technique. Although her findings are exploratory, there is an indication that social status is an important variable. Hourihan (1979) relates preference to the broader aspect of evaluation in a study of urban neighbourhoods in Dublin. Using MDS to reveal significant dimensions, he indicates the significance of perceived social status in identifying preferred residential areas.

Bunting and Guelke (1979), in their criticism of behavioral geography, claim that attempts to establish adequate links between image and behavior have not been succesful[14]. However, as Silzer (1972, 20) indicates, "the link between preferences and overt action is difficult to establish because reality constrains overt action whereas it may not constrain preferences". Palmer (1978, 1141) further emphazises that the notion of preference constitutes an ideal that is seldom realised. Despite these difficulties attempts have been made to link preference and behavior. In a study of university students, Lloyd (1976) examines the similarities between their cognitive information concerning states of the United States, preferences for these states, and actual migration behavior. Using MDS techniques to analyse the data, he concludes that the students' cognitions and preferences are good predictors of the general migration

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[14] Golledge (1981, 1338) suggests, however, that such criticism is due to "a fundamental misunderstanding of the nature of work in this area".

flows in the United States. Lieber (1974) relates preference to intended behavior in a study of graduating students from the University of Iowa. He finds that for two-thirds of his subjects expressed preferences lead to subsequent corresponding migration.

2.2 NORTHERN CANADIAN RESOURCE COMMUNITIES

Traditionally planning and development in northern Canada have emphasised economic and technological aspects of resource extraction. However, the problems resulting from the difficulties of attracting and maintaining a stable labor force have recently given rise to concern about social and environmental issues. In a study of mining communities carried out by Canada, Energy Mines and Resources (1976, 1) it is noted that, "neither comprehensive studies nor hard data are available on the key mining community characteristics and manpower behavior". The limited work that has been carried out can be categorised into three groups:

(1) those concerned with the objective analysis of socio-economic characteristics of resource communities;

(2) studies focusing on aspects of labor turnover;

(3) those dealing with the subjective elements of quality of life and residential satisfaction in resource communities.

Each of these approaches is discussed in turn.

2.2.1 Socio-economic Characteristics

The most comprehensive study of the social and economic characteristics of single-resource communities in Canada is provided in a report entitled Single Sector Communities (Canada, Department of Regional Economic Expansion, 1979)[15]. Although all single resource communities included in the report are not located in northern Canada, many common socio-economic characteristics exist. The existence of single resource communities, for example, is dependent upon "the economic viability of the dominant industry, whose future is often determined by forces beyond the control of the community" (Canada, Department of Regional Economic Expansion, 1979, 1). The study emphasises the need for focusing on the social problems associated with the fluctuating economic well-being of the community.

The stages of economic development of the single resource community are identified by some authors (Lucas, 1971; Wichern et al., 1971). They consider that communities evolve in a series of discrete stages, each marked by differences in demographic composition and physical structure. Lucas (1971) identifies four stages: construction, recruitment, transition, and maturity. Many of the single resource communities in northern Canada are mining towns of relatively recent origin and most have been developed since 1945. In a study of mining communities

[15] First published in 1974 under the title Single Industry Communities in the Canadian Context.

(Canada, Energy, Mines and Resources, 1976) the population of the smaller, more northerly mining settlements is characterised as predominantly in the 20-39 year old age group with a higher proportion of younger children than the Canadian average. This demographic structure is characteristic of the "recruitment stage" identified by Lucas (1971). In the Canada, Department of Regional Economic Expansion study (1979) of single resource communities, a factor analysis identifies this type of community which is found to be associated with high mobility, migrants, ethnic differences, mobile homes, and dwellings built in the last decade.

The characteristics of the built-environment of the single industry town are largely a reflection of the size and age of the community. Three aspects of the community infrastructure: housing, education, and health care, are considered to be problems (Canada, Department of Regional Economic Expansion, 1979). Home ownership is viewed as being an important indicator of residential expectations. Declining property values may reflect a loss of confidence in the town's future. For example, a recent real estate survey revealed that house prices in Thompson, Manitoba, were the lowest of any urban center west of the Atlantic provinces (Permanent Real Estate, 1981). Presumably this is a reflection of the recent economic cutbacks and uncertain future (See Section 4.1.1). Cawsey and Richardson (1975)

indicate a close parallel between availablity of housing and turnover rates among married employees. In a sample of Canadian mining communities, single family dwellings comprised 64.2 percent of the housing stock, apartments 33.9 percent and mobile homes 1.9 percent (Canada, Energy, Mines and Resources, 1976). These average figures do however conceal considerable differences. For example in Grande Cache, Alberta, and Pine Point, Northwest Territories, one quarter of all dwellings are mobile homes.

As the proportion of children in single resource communities is high, education facilties are of concern to many residents. All communities provide elementary education facilities, but some lack secondary educational facilities. In addition, all but the larger and more diversified commuities, (e.g. Sudbury, Ontario) lack post educational facilities (Canada, Energy, Mines and Resources, 1976). On the basis of a factor analysis study, the Department of Regional Economic Expansion (1979) study reveals that lower educational levels are associated with isolation from metropolitan areas. Although there is little evidence of the quality of education provided in isolated single resource towns, there are high levels of teacher turnover and a high proportion of inexperienced teaching staff (Canada, Energy, Mines and Resources, 1976). These tendencies are thus suggestive of the possibility of lower educational quality.

Medical facilities in Canadian mining communities are limited to the provision of standard facilties relative to the size of the community (Canada, Energy, Mines and Resources, 1976). A lack of specialised medical services often requires long costly trips to major centers and has been cited as a major cause of dissatisfaction (Canada, Energy, Mines and Resources, 1976). Additionally, high turnover of medical staff further reduces the quality of service (Canada, Department of Regional Economic Expansion, 1979).

2.2.2 Labor Turnover

Of particular concern in studies of single resource communities are factors associated with labor turnover. The rate of turnover as defined by Statistics Canada (1972) is, "the number of replacements, taken as the smallest of hirings or separations, as a percentage of the total workforce during the period". Turnover rates are affected by differences in job, company and location. In the mining industry, statistics disclose that the mean turnover rate for the most mobile job category, the unskilled laborer, was 127.8 percent in 1973 (Mining Association of Canada, 1974). The turnover rate for skilled miners was 49.8 percent, but lower for management personnel. MacMillan et al. (1974) indicate the average annual turnover rate for Canadian mining companies is 80 percent. Turnover is especially

likely to occur during the first six months of employment. The cost of turnover to the mining industry was estimated to be as high as $350 million in 1974 (Mining Association of Canada, 1974). Cawsey and Richardson (1975) indicate that the problem of turnover varies regionally, with companies in British Columbia experiencing higher rates than other provinces. MacMillan et al. (1974) examine data from Canadian mining communities and determine that the highest rates of turnover occur among young unmarried employees, with increasing stability related to marriage and advancing age. Cawsey and Richardson (1975) further state that married workers provided with a house in the community are relatively stable.

Research indicates that reasons for labor turnover are diverse. For instance, Cawsey and Richardson (1975, 24) state that, "each company faces a unique set of problems which it must deal with if it is to reduce the magnitude of turnover". However, Palmer (1962) identifies a set of factors which he believes are common to all turnover situations and which affect this problem to varying degrees. These factors relate to (1) attachment to occupation, (2) attachment to company, and (3) attachment to community. They found that unskilled workers had a greater attachment to their employment than skilled workers who related more strongly to an occupation. A study by Pinfield and Boyt (1974) indicates that the relative importance of the three

factors (occupation, company, and community) changes with the length of an employee's association with the company. They believe that with increased length of stay, the reasons for deciding to "quit" show a gradual transition from factors associated with the community, to a mixture of community and job factors, then finally to job-related factors.

Several studies conclude that isolation and the absence of community facilities are not significant factors affecting turnover. Instead the reasons for "quitting" are related more to job or company factors (Algar, 1973; MacMillan et al., 1974; Canada, Energy, Mines and Resources, 1976). However, Cawsey and Richardson (1975, 16) do state that creating a "community of interest" in which the employee "has a stake" is a key element in employee recruitment and retention strategy.

2.2.3 Quality of Life and Residential Satisfaction

A study by Canada, Energy, Mines and Resources, (1976, 1), defines quality of life as "a subjective assessment of how well our lifestyles match our needs and aspirations". The quality of life is more or less synonymous with assessment of place utility. Much of the work on quality of life in northern Canadian resource communities has been carried out at the Center for Settlement Studies at the University of Manitoba. For example, Matthiasson (1970) conducted a

survey in Whitehorse, Yukon; LaRonge, Saskatchewan, and Fort McMurray, Alberta, and identifies residents' sources of dissatisfaction with their communities. The most frequently mentioned needs for community improvement are cost of living, housing and accommodation, good access to cities in the south, entertainment, recreation and media communication. Similar factors are found to be sources of dissatisfaction in a study of Thompson, Manitoba, (McKenzie et al., 1978) which examines the social impact of economic cutbacks and job reduction in the community. On a more subjective level, Nickels and Kehoe, in a study of mental health in northern communities, suggest that:

> for those seeking adventure on the frontier there is too little excitement; for those seeking the comforts of suburbia, isolation is too great, there are too many mosquitoes, too little privacy and too many expenses (1976, 20).

Not all aspects of life in northern resource towns are viewed negatively, however, with several studies indicating sources of satisfaction for some residents. A study by Jackson and Poushinsky (1971) in northern Ontario mining communities find satisfaction to be related to the number of friends in the community, recreational facilities, entertainment and schools. Lauder (1977), in a study in Leaf Rapids, Manitoba, finds that the greatest levels of satisfaction with the community are related to the wilderness setting and the opportunity thus afforded for recreation. Riffel (1975, 22) also comments on this

positive aspect of quality of life in northern communities, stating that "for many the desire to be close to nature is a significant incentive (second only to economic considerations) to move to and remain in a resource town". Other aspects of life in northern resource communities which appeal to some residents include: greater opportunity for community involvement, friendliness, slower pace of life, and a good environment in which to raise children (Canada, Energy, Mines and Resources, 1976). Three further factors suggested by Lauder (1977) as having a significant influence on one's satisfaction with the community are: population size, location in relation to other communities, and economic stability of the community.

2.3 SUMMARY AND PLACE OF THE STUDY WITHIN THE LITERATURE

Research relevant to the present study relates to two areas of inquiry, (a) studies of the environmental image, and (b) studies of northern Canadian resource communities. Earlier studies of the environmental image focus on designative aspects of the image and frequently employ cognitive mapping techniques based on the seminal methodology introduced by Lynch (1960). The findings of Lynch's work suggest that two of the variables examined in the present study, length of residence and differences in sex, are salient influences upon the structural nature of the image (Klein, 1967; Appleyard, 1970; Devlin, 1970; Porteous, 1971; Everitt and Cadwallader, 1972).

The appraisive aspects of the image relate to the meaning associated with the physical form, and include evaluation and preference. The most common methods used to examine this aspect include the semantic differential (e.g. Downs, 1970b; Harrison and Howard, 1972; Lowenthal and Riel, 1972; Burgess, 1978). and repertory grid technique (e.g. Hudson, 1974; Harrison and Sarre, 1975; Palmer, 1978). Responses to data elicited using these techniques are frequently analysed using either factor analysis (e.g. Downs, 1970b; Golant and Burton, 1970; Townsend, 1977) or multidimensional scaling (e.g. Burnett, 1973; Palmer, 1978).

Studies focusing on the evaluation of places are of particular relevance to the present study. Specifically, the concept of place utility (Wolpert, 1965) has received considerable attention in studies which attempt to uncover the underlying dimensions of migration decision-making (e.g. Brown and Moore, 1970; Demko, 1974; Gustavus and Brown, 1977). In other studies, factors including residential experience (Wohlwill and Kohn, 1973), community size (Demko, 1974), and stage in the life cycle (Preston and Taylor, 1981a), are examined in terms of their influence on an individual's evaluation of places.

The limited number of studies relating specifically to northern Canadian resource towns examines their socio-economic characteristics (Lucas, 1971; Canada, Energy, Mines and Resources, 1976; Canada, Regional Economic

Expansion, 1979), labor turnover (MacMillan et al., 1974; Cawsey and Richardson, 1975), and quality of life (Matthiasson, 1970; Riffel, 1975; Lauder, 1977). Northern resource communities are generally recognised as evolving through various stages which are identifiable in terms of distinct economic, social and infrastructural characteristics (Lucas, 1971; Wichern et al., 1971; Canada, Regional Economic Expansion, 1979). High rates of labor turnover are experienced in most communities. These are attributed to a variety of factors associated with characteristics of the company, community, occupation, and individual (Palmer, 1962; Cawsey and Richardson, 1975).

Studies of quality of life attempt to determine those aspects of life in northern resource communities which produce residential satisfaction or dissatisfaction (Matthiasson, 1970; Jackson and Poushinsky, 1971; Nickels and Kehoe, 1972; McKenzie et al., 1978). Factors which researchers suggest contribute towards community dissatisfaction include cost of living, housing, access to cities in the south, entertainment, and recreation facilities (Matthiasson, 1970; Nickels and Kehoe, 1972; McKenzie et al., 1978). Positive attributes relating to levels of satisfaction appear to be friendliness of the communities, opportunity for community involvment, wilderness settings, and the suitability of the environment for raising children (Jackson and Poushinsky, 1971; Riffel, 1975; Canada, Energy, Mines and Resources, 1976).

The present study contributes to the existing body of literature by examining environmental images of northern Canadian resource towns. The existing studies of such towns which focus on the subjective aspects of community assessment are limited both in number and scope. Most studies are restricted to descriptive statistical analysis. The present study attempts to expand the general body of knowledge concerning evaluation of northern resource towns by focusing on variables (i.e. community environment, length of residence, sex, and marital status) which existing literature and preliminary field investigation suggest are likely to be of particular importance. In addition, it conceptually links the environmental image to migration decision-making by examining the underlying bases of community preference. The study also offers a further contribution to the expanding body of research which utilises personal construct theory as a conceptual base for examining the environmental image. A related concern is the application of a modified form of repertory grid technique which may contribute towards work on the methodological procedures in image elicitation.

Chapter III

HYPOTHESES AND REPERTORY GRID TECHNIQUE

The variables which are selected for examination in the study are first discussed. The hypotheses of the study are then derived and presented. Following this is an outline of the repertory grid technique, one of the major methods employed to test the hypotheses. The chapter concludes by presenting a rationale for selection of the repertory grid technique on the basis of a comparison with another frequently used method of cognitive measurement, the semantic differential (Osgood et al., 1957).

3.1 SELECTION OF VARIABLES

Empirical tests indicate that differences among environmental images are related to many variables (see Section 2.1). In the context of the present research, hypotheses are formulated to test three major variables that have been postulated to influence the nature of the image:

1. community environment
2. length of residence
3. selected social characteristics, specifically sex and marital status.

These variables are selected because they represent either (i) aspects of environmental cognition that existing research indicates require further testing, or (ii) characteristics that are of particular significance in the context of northern resource towns. A more detailed justification for this selection of variables is next presented.

3.1.1 Community Environment

Two aspects of community environment are examined. These are the separate influences of (i) the present community environment and (ii) previous residential environments on the image. These aspects of community environment are selected to be investigated for two reasons. First, both past and present environments appear relevant to the frame of reference within which community evaluation occurs. The relevance of the frame of reference for image construction is widely acknowledged conceptually (Helson, 1964; Wolpert, 1965), but there has been little empirical investigation of this concept. Wohlwill and Kohn (1973, 1975) investigate the influence of the size of migrants' most recent previous places of residence, but this represents only one of the experienced environments which may influence evaluation. The examination of the significance of the present community environment, and previous residential environments (specifically, the size and location of childhood

communities) is designed to provide a more general insight into the paramenters employed by individuals in structuring place images.

Secondly, the influence of the present community environment is examined more specifically to determine the effects of the environment on the nature of the dimensions of the image. Previous studies have exhibited a relationship between the environment and such designative aspects of the image as orientation (Lynch, 1960; Appleyard, 1970) and distance estimation (Canter and Tagg, 1975; Cadwallader, 1976), but there has been little empirical work concerning the effect of the environment upon the overall structure of the image (Moore, 1979). For example, do residents in different community environments employ similar constructs? The selection of two contrasting communities is explicitly designed to permit such comparisons.

3.1.2 Length of Residence

Length of residence is selected for investigation because of the high levels of population mobility that characterise many northern resource towns. An examination of the images of respondents with differing length of residence characteristics should contribute towards a clearer understanding of the factors which underlie residential stability in these communities. In addition, existing theory (Kelly, 1955; Helson, 1964) and empirical studies

(Appleyard, 1970; Francescato and Mebane, 1973; Devlin, 1976) offer support that this variable is of particular significance concerning image construction.

3.1.3 Sex and Marital Status

Several studies identify varying group images on the basis of common social characteristics (e.g. Orleans, 1967; Goodchild, 1974). Of the numerous social variables which may influence image formation, sex and marital status appear to be of particular significance in a study relating to to migration in northern resource communities. Several authors suggest (e.g. Cawsey and Richardson, 1975; Riffel, 1975) that both these variables are associated with aspects of labor turnover. Single men generally represent the most mobile sector of the population, and the dissatisfaction of married women with life in resource towns has been suggested as a significant reason for families leaving these communities (Riffel, 1975). Thus, an examination of the effect of these variables on the nature of the image is designed to provide a clearer understanding of their relationship to community evaluation and migration decision-making.

3.2 THE HYPOTHESES

In accordance with the objectives, the following hypotheses are formulated with reference to previous research findings and preliminary field investigation.

3.2.1 Hypotheses concerning Community Environment

The objective is to determine the effect of the community environment on the dimensions of residents' images. The two study communities of Thompson and Leaf Rapids, although possessing a similar functional and locational base, differ in terms of size and relative accessibility to southern Manitoba. Further evidence that the communities differ in other ways is provided in a government study of single resource communities. Contrary to initial beliefs, it is found that communities engaged in the same economic activities are not neccesarily similar in terms of numerous socio-economic variables (Canada, Department of Regional Economic Expansion, 1979). It is therefore anticipated that these differences will be reflected in the community images held by residents. The hypothesis formulated is:

Hypothesis 1:

> that the dimensions of residents' images of Thompson and Leaf Rapids are related to community environment.

It is further postulated that places of previous residence operate as "reference communities" against which residents evaluate their present community. The theoretical base

underlying the derivation of this hypothesis is Helson's adaptation theory which states that "residual variables", consisting of previous experience with comparable stimuli, are one of the three classes of variables which determine an individual's evaluation (see Section 2.1.2.2). Wohlwill and Kohn (1973) examine the theory in an environmental context and find differences in the adaptation level of migrants related to the size of the previous community in which they lived. It is also believed that the location of previous residence has a significant influence upon the dimensions of residents' images. Migration studies reveal not only a greater quantity and quality of information held by short distance migrants (Gustavus and Brown, 1977; White, 1977), but also higher levels of preference for nearby places (Gould, 1966). In this study it is argued that the place in which a person is born and raised will influence the image of the present community of residence. Specifically, it is argued that there are differences among the images of individuals raised in small communities of under 25,000 population and those originating from larger communities[16]. It is also argued that there are differences in the images among those born and raised in Manitoba and those from outside the province. The hypothesis formulated is:

Hypothesis 2

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[16] This represents an arbitrary distinction between "small" and "large" communities based on a subjective assessment of predominantly social variables.

> that the dimensions of residents' images of northern resource towns are influenced by the size and location of the communities in which they were born and raised.

3.2.2 Hypotheses concerning Length of Residence

The objective is to investigate the relationship between the dimensions of the image and length of residence in the community. It is postulated that, as a result of residential experience, residents restructure the cognitive dimensions of the image of the community in which they live. The basic theoretical concept of restructuring of cognitive dimensions is expressed by Kelly (1955) in a corollary to his fundamental postulate on personal construct theory (Appendix A). Specifically, the Experience Corollary states that:

> A person's construction system varies as he successively construes the replication of events.

(Fransella and Bannister, 1977, 172). Further theoretical support for the restructuring of image dimensions is provided by adaptation theory (Helson, 1964) which implies the increasing adaptation of a person to a stimulus over time. In an environmental context, several studies have in fact demonstrated relationships between length of residence and cognitive responses (Appleyard, 1970; Francescato and Mebane, 1973; Moore, 1975; Devlin, 1976).

There is fairly conclusive evidence that economic factors, such as availability of employment and high wages,

are the primary reasons for migration to northern communities (Siemens, 1973; Riffel, 1975; Lauder, 1977). In a more general context, Demko (1974) suggests that once economic needs have been satisfied socio-environmental variables assume greater importance. It is therefore postulated that economic dimensions are a more significant feature of the community image of a short-term resident[17]. It is argued that these dimensions will not only reflect concern for strictly economic attributes (e.g. wage level and job security), but also for aspects of the quality of life made possible by a satisfactory personal economic situation. Thus, it might be expected that short-term residents emphasise the consumer and recreational aspects of the community environment. It is further postulated that longer-term residents, while remaining concerned with the aspects of the community which are important to short-term residents, conceive of the quality of life in a broader community-related sense. This broader image would include not only concern for physical, but also social attributes of the community. The nature of the changing focus of the community image is suggested in the concept of social egocentricity, which Sonnenfeld (1982, 68) indicated varies

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[17] In this study, a distinction is made between short-term residents who have lived in the community for less than five years, and those who have been residents for five years or more. This distinction is somewhat arbitrary, but is designed to identify those residents who have consciously evaluated life in the community and decided to remain, from those who have perhaps not yet done so.

inversely with "sense-of-place". On this basis, the following hypotheses are formulated:

Hypothesis 3

> that short-term residents' images of northern resource communities are related to personal aspirations rather than community related factors.

Hypothesis 4

> that longer-term residents' images of northern resource communities are predominantly structured in terms of community related factors.

3.2.3 Hypothesis concerning Marital Status and Sex

The objective is to determine the relationship between the dimensions of the image and two selected social characteristics of the residents: sex and marital status. The two social variables selected in this study are considered to be especially pertinent in the context of northern resource communities. Many women migrate to these communities on account of their husband's employment, and previous work reveals that the dissatisfaction of many wives increases residential instability (Riffel, 1975). In a more general context, studies of urban neighbourhood cognition in American cities reveal differences between men and women (Everitt and Cadwallader, 1972,1977,1981; Orleans and Schmidt, 1972). Marital status is also considered to be a significant social variable in relation to community image and residential stability. Studies of labor turnover reveal the single worker to be the most mobile element of the

population in resource communities (Cawsey and Richardson, 1975; Canada, Energy, Mines and Resources, 1976). The social and community needs of the single resident are obviously different from that of the married resident and thus one would expect the evaluative dimensions of the image to differ accordingly. It is argued that single residents place greater emphasis on the social, recreational, and economic characteristics of the community, while married residents emphasise aspects of the community associated with family life such as housing availability, shopping facilities, schools, and community safety. The hypothesis thus formulated is:

Hypothesis 5

> that the images of northern resource communities are related to the residents' sex and marital status.

3.3 REPERTORY GRID METHODOLOGY

In this section repertory grid methodology is examined. This technique and the related theory represent the major framework within which the hypotheses are tested. Personal construct theory (Kelly, 1955), which underlies the repertory grid technique, is first presented. This is followed by a description of the procedure for deriving the repertory grid.

3.3.1 Personal Construct Theory

Personal construct theory was first proposed in the field of clinical psychology by Kelly (1955). It is formally presented as a fundamental postulate modified by eleven corollaries (Appendix A). The basic postulate states that,

> A person's processes are psychologically channelised by the ways in which he anticipates events (Kelly, 1955, 46).

Kelly envisages man as a scientist who makes sense out of the environment by constructing a theoretical framework, or personal construct system, which guides his thought patterns and behavior. Kelly (1969)[18], describes a construct as follows:

> A construct is like a reference axis, a basic dimension of appraisal, often unverbalised, frequently unsymbolised and occasionally unsignified in any manner except in the elemental process it governs. Behaviorally it can be regarded as an open channel of movement, and the system of constructs provides each man with his own personal network of action pathways, serving both to limit his movements and to open up to him passages of freedom which otherwise would be psychologically non-existent.

An essential characteristic of a construct is that it is bipolar. This is expressed in Kelly's Dichotomy Corollary which suggests that we make sense out of the world by simultaneously noting likenesses and differences. Constructs are also hierarchical in nature (Organisation Corollary) with superordinate constructs subsuming more detailed constructs[19]. A further property of constructs is

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[18] Cited in Fransella and Bannister (1977, 3).

expressed in the Range Corollary which states that:

> A construct is convenient for the anticipation of a finite range of events only.

In other words a construct must be relevant to, or within "the range of convenience" of the elements to which it is applied. Two further corollaries that are particularly relevant to the present study are the Experience Corollary and the Commonality Corollary. The Experience Corollary refers to the constant modification of a person's construct system as a result of experiencing similar situations. The Commonality Corollary provides support for examining group images as it states that:

> To the extent that one person employs a construction of experience which is similar to that employed by another, his psychological processes are similar to those of the other person's (Kelly, 1955, 90).

3.3.2 Derivation of the Grid

The repertory grid test was developed as a means of measuring the personal construct system. The grid consists of a matrix comprised of an individual's scores assigned to elements on a set of constructs. Fransella and Bannister (1977, 5) suggest that the grid technique is best looked on as a particular form of structured interview by which conversation, our normal way of exploring another

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[19] An example of a superordinate construct in the present study might be "large-small" which subsumes constructs such as "good shopping facilities-poor shopping facilities".

individual's personal construct system, is formalised. This permits mathematical values to be assigned to the relationships between a person's constructs. The elements are chosen to represent the area in which construing is to be investigated. The elements in Kelly's study of interpersonal relationships were people. However, Harrison and Sarre (1975) were among the first authors to apply the repertory grid to environmental images. They use urban locations within the city of Bath as their elements. In other studies of environmental images, sets of elements are comprised of shops (Hudson, 1974), urban landmarks (Tranter and Parkes, 1979), colonial farms (Townsend, 1977) and rural recreation facilities (Palmer, 1978). An important requirement is that the elements are within the range of convenience of the grid. Kelly employs a technique of "role model lists" in his work. This requires subjects to name elements which perform or fulfill certain roles. In some cases, elements are provided by the researcher and referred to as "standard elements". This guarantees comparability of response between respondents, but diminishes the grid's sensitivity to individual variations in perception (Harrison and Sarre, 1975).

Kelly suggests various forms of construct elicitation, most of which are based on the triad sorting method. Respondents are presented with triads of elements and are asked to specify "some important way in which two of them

are alike and different from the third" (Kelly, 1955). The reason given for the difference is the "emergent pole" They are then required to state how the third element differs from the other two. This response provides the "contrast pole". Several variations of the method relate to the number and selection of triads presented to the subject. In some variations, the selection depends solely on the discretion of the researcher, whereas in others all possible combinations are presented (Fransella and Bannister, 1977). In further variations, the elements in the triad are changed one at a time in sequential form (Fransella and Bannister, 1977). Of relevance to the present study is the "Self-Identification Form" of elicitation. In this case, the elements are presented in sequential form and always include the element "myself", thus ensuring personal relevancy (Fransella and Bannister, 1977). This form is adapted in the present study so that the respondent's home community is always included among the presented elements.

Kelly's use of the triad method is based on his theory concerning the manner in which constructs are first formed (Kelly, 1955) However, Fransella and Bannister (1977, 16) state that, "there is nothing sacrosanct about the triad. It is equally reasonable to use two elements for elicitation". Dyads have, in fact, been employed where triadic elicitation methods have been too complex a cognitive task for such subjects as children or those with

low educational levels (e.g. Ryle and Lunghi, 1970; Salmon, 1970). In addition, research by Epting et al. (1971) indicates that the standard triad method is less succesful than the "opposite method" when attempting to elicit the "contrast pole". These authors achieve more satisfactory results by simply asking the respondent for the opposite to the "emergent pole".

In some situations, the constructs are apparently supplied by the researcher rather than elicited from the respondent. Fransella and Bannister (1977, 19) emphasise however, "that one is essentially supplying the verbal labels to which the person will attach his personal constructs; what is essential is that the labels be meaningful to the subject". In comparing results from studies using elicited versus provided constructs, Adams-Webber (1970), concludes that, although subjects prefer using their own verbal labels, they can effectively use provided labels. Fransella and Bannister (1977, 19) state that:

> it is common practice to collect a sample of constructs from a comparable group or the group itself. You are then fairly safe in assuming that the most commonly used constructs for that group will be meaningful to the individual.

In an environmental context, Tranter and Parkes (1979) derive standard constructs relating to urban images from a small subsample of their respondents.

After the bipolar constructs have been elicited, the next stage of the repertory grid technique requires the respondent to either rank or rate elements on each of the constructs, thus producing a matrix of scores. Ranking of elements has been widely used in clinical psychology (e.g. Bannister, 1963; Fransella, 1972). Basically, the method requires the subject to rank-order the elements between the poles of each construct. In the rating grid, the elements are rated on a scale (frequently comprised of seven response categories) defined by the two construct poles. This format closely resembles that of the semantic differential (Osgood et al., 1957) but the underlying assumptions are theoretically different. These differences are discussed in the next section of this chapter.

3.4 COGNITIVE MEASUREMENT TECHNIQUES

The two methods most commonly used to measure cognitive images are the repertory grid technique and the semantic differential. In the present study the use of a bipolar adjectival rating scale, although superficially resembling a semantic differential rating scale, is in fact an adaptation of the repertory grid. In order to support the selection of the repertory grid technique, the significant differences between the two methods are compared. This section concludes by specifically outlining the application of the repertory grid technique in the present study.

The semantic differential was developed by Osgood and others (1957) to measure the connotative aspects of the meaning of language. Osgood carried out extensive experiments to develop the basis of the semantic differential. Subjects rated various concepts on a wide variety of randomly selected bipolar adjectives. The results were factor analysed and produced consistent responses, indicating that three basic dimensions account for most of the variance in meaning of language: evaluation (e.g. good-bad), potency (e.g. strong-weak), and activity (e.g. fast-slow). On the basis of these findings, Osgood developed the original semantic differential which consisted of bipolar adjectival scales representing the three most commonly occuring dimensions.

The format of the semantic differential has subsequently involved the selection of a number of scales considered by the researcher to be relevant. As a result the degree of conformity to Osgood's original scales has varied. Geographers employing the technique have modified the scales in a variety of ways. For example, Downs' (1970) study of attributes of shopping centers uses a set of bipolar adjectival scales derived from informal discussion with shoppers. In her examination of stereotyped urban images, Burgess (1978) uses a slightly more formal approach suggested by Miron and Osgood (1966). This approach uses a free association test to elicit adjectives relevant to a variety of place names.

The most widespread criticism of the semantic differential is that the scales are pre-selected by the researcher and therefore may not be relevant to the respondent (e.g. Bannister and Mair, 1968; Burgess, 1978). Osgood et al. (1957) conceptually recognise meaning as being personal, but allow the subject to express meaning only within the dimensions designated by the researcher. Osgood et al. (1957) also conceptualise meaning as a multidimensional structure but limit it to three dimensions in the context of the semantic differential technique. Although Bannister and Mair (1968) agree that the major dimensions of evaluation, potency, and activity are common superordinate constructions in our society, they argue that the semantic differential ignores other individual constructions which may be quite different. Although the evaluative dimension is usually clearly identified, the other two dimensions (potency and activity) are less well defined. In an environmental context, an unambiguous definition of these latter two dimensions has proved particularly difficult (e.g. Golant and Burton, 1970; Burgess, 1978).

Kelly (1955) emphasises the importance of "range of convenience", a concept ignored by Osgood. As a result, in many studies using the semantic differential, one finds scales that are totally irrelevant. This is particularly true in environmental studies where researchers have

endeavored to adhere to the major dimensions proposed by Osgood. In Golant and Burton's (1970) study, for example, respondents were asked to rate such concepts as "air pollution" on the dimensions "peaceful-ferocious" and "orderly-chaotic". Burgess (1978), who incorporates some of Osgood's original scales into her final selection of scales asked respondents to rate places along such dimensions as "sweet-bitter" and "sharp-dull". It is reasonable to assume that such examples would be outside the range of convenience of respondents and produce redundant responses.

A further criticism of Osgood's technique is that, although he recognises the importance of bipolarity in meaning and incorporates this idea into his scales, he fails to conceptualise it in his underlying theory. Through the use of factor analytic procedures, Osgood also implies the hierarchical nature of construing but provides no mechanism for the subject to express this (Bannister and Mair, 1968).

Criticism of the repertory grid technique, on the other hand, focuses on the problems of handling the large amounts of data generated for each individual and the length of time required to administer the test. Outside the field of psychology, the technique has usually been applied to test differences in an aggregated form of group responses. Frequently, studies have been limited to small homogeneous samples: for example Hudson (1974) investigates 26 university students, while Harrison and Sarre (1975) focus

on 20 housewives. Recently, studies utilising modified versions of the grid technique have employed larger samples. For instance, Lieber (1978) applies the technique to a sample of 464 university students using a mail questionnaire, while Leiker (1976) samples 120 high school students. Harrison and Sarre (1975) state that the overriding problem is to find methods of aggregating individual results without undue distortion. In an environmental context where aggregate responses are frequently sought, this has resulted in the extensive use of standard elements and constructs (e.g. Harrison and Sarre, 1975; Tranter and Parkes, 1979). As Hudson (1980, 349) indicates, while the analysis of such data using factor analytic techniques yields a more parsimonious description of the structure of the image, there are also several negative consequences. These include the loss of much of the original richness, complexity and idiosyncracy of individual grids.

From a theoretical perspective, the close ties between the underlying personal construct theory and the associated repertory grid technique have been rarely questioned. It is the firm grounding of the technique in a theory of cognitive psychology that has made it appealing to geographers (Harrison and Sarre, 1971). There has been criticism that the provision of standard elements divorces the technique from the underlying personal constructs (Chetwynd, 1973).

Downs (1976, 75) however supports Bannister and Mair (1968) in stating that "it is impossible to separate the theory of personal constructs from its operational procedure".

In the present study, an attempt is made to overcome the problems of administering the repertory grid to a large sample while still retaining the essential conceptual framework of personal construct theory. Using a dyad method, personal constructs are elicited from a small representative sample of residents[20] in each of the two study communities. To ensure relevancy, an adaptation of the "Self- Identification Form" of construct elicitation is employed such that the respondent's place of residence is always included in the dyad. Bipolar opposites of the "emergent poles" are elicited using the "opposites method" (Epting et al., 1971). These form the supplied constructs for the rating grid on which a larger sample of residents rate the community in which they live (i.e. the standard element). Although superficially resembling the semantic differential, the procedure differs conceptually in terms of the derivation of the bipolar scales. The scales are not associated with Osgood's dimensions but are instead personal constructs. While recognising that the aggregation of personal constructs reduces the sensitivity of the grid technique, the essence of personal construct theory is nevertheless retained, and the influence of the researcher

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[20] The sample includes 38 subjects.

on the response of the individual is consequently reduced.

3.5 SUMMARY

On the basis of findings of previous research, and preliminary field work, five hypotheses are derived. The nature of the community image is hypothesised as being influenced by the present community of residence, past residential experience, length of residence, differences in sex, and marital status. Personal construct theory and the associated repertory grid methodology are examined as a conceptual framework within which to examine the hypotheses. The use of an adapted form of repertory grid technique is rationalised by examining the advantages of this method over the semantic differential, which is the most frequently applied alternate method of eliciting cognitive images.

Chapter IV

DATA SOURCES

In this chapter the study communities are first described and followed by a discussion of the data collection procedures. The data were collected in two stages, with data from the preliminary field investigation providing the input for the design of the final questionnaire. The chapter concludes with a description of the sampling design and questionnaire administration.

4.1 STUDY COMMUNITIES

Two resource communities in northern Manitoba, Thompson and Leaf Rapids, are selected as the study communities (Figure 2). Although functionally similar, they offer a contrast in terms of size, company affiliation, age of community, relative accessibility, and urban design. In addition, these communities differ in terms of the three factors hypothesised as having significant effect on the image: the economy, community environment, and length of residence. Each community is discussed in turn, and the above characteristics expanded upon.

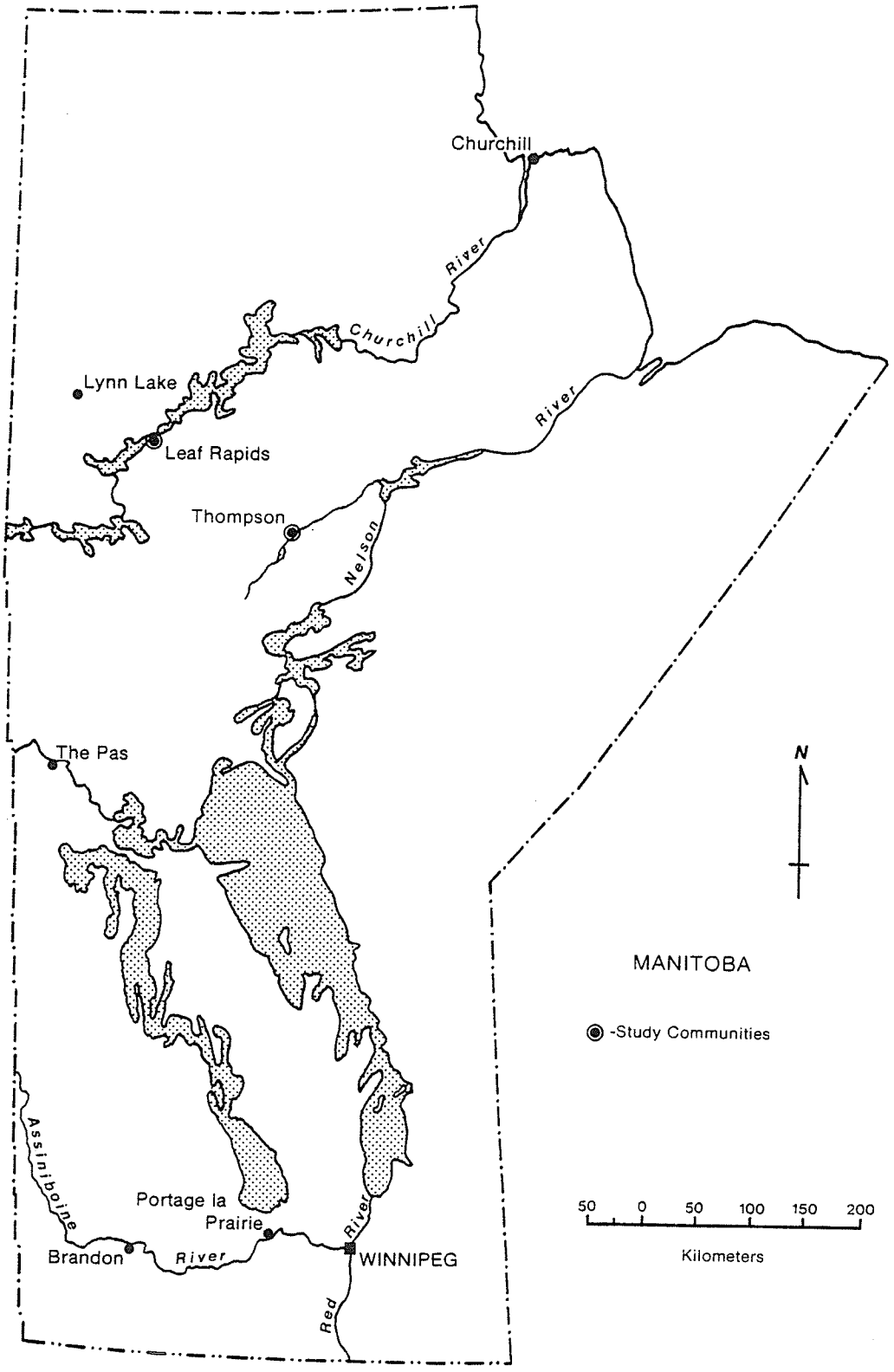

Figure 2. Location of Study Communities

4.1.1 Thompson

Thompson is located approximately 750 kilometers north of Winnipeg and is the larger of the two study communities. With a peak population of 21,034 in 1978, Thompson ranked as Manitoba's third largest city and one of the largest mining communities in northern Canada. As a result of economic cutbacks in the nickel mining industry, the 1980 population had declined to 14,500. International Nickel Corporation[21] commenced nickel mining operations in the vicinity of Thompson during 1957 and construction of the town commenced in the following year. A few of the present residents of Thompson have lived there for over 20 years. The community's economy and existence are both largely dependent on INCO's nickel mining and processing operations, although the city also functions as an administrative and regional center for northern Manitoba. A breakdown of the community's labour force for 1977 indicates that 48 percent of the working population is employed by INCO (McKenzie, 1978).

Thompson is well served by transportation facilities. Road access to the south is provided by an all-weather paved highway, while gravel roads afford access to other northern communities. Rail transportation provides both freight and passenger service to Winnipeg. In addition, there is a daily jet air service to Winnipeg, while both scheduled and

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[21] Now called Inco Metals Company

charter air services provide linkages with the remote, northern communities that Thompson serves.

The city provides services for a total trading population of over 25,000. In 1978 there were 77 retail and 109 service outlets in the community (Manitoba, Department of Industry and Commerce, 1978a). The retail facilities are largely concentrated in two downtown shopping malls, while several smaller shopping areas in the residential districts provide groceries and convenience goods. Additionally, Thompson has six elementary schools, one high school, and a 150-bed hospital. Recreational facilities in the city include an ice arena, curling rink, swimming pool, tennis courts and indoor racquet courts. There is also easy access to a wide variety of outdoor recreational facilities including downhill and cross-country skiing, golfing, fishing and boating. A cottage area, campgrounds, and modern marina are situated at Paint Lake about 33 kilometers south of the city.

Many types of housing are available in Thompson including luxury high-rise apartments, townhouses, single-family dwellings, and mobile homes. Due to the recent decline of population in Thompson, nearly all types of purchased and rental housing were readily available in 1979-1980. The town, which was initially subject to planning by the Metropolitan Planning Commission of Winnipeg, is designed on the "neighbourhood principle" (Perry, 1929). Residential

districts are distinguishable on the basis of relatively homogeneous housing types, and these have created distinct socio-economic characteristics within each neighbourhood (Manitoba, Department of Municipal Affairs, 1980).

4.1.2 Leaf Rapids

Leaf Rapids is located on an all-weather gravel road 212 kilometers northwest of Thompson, and 105 kilometers southeast of Lynn Lake. In 1980 the town had a population of 2,368. It was constructed between 1971 and 1974 and functions primarily as the service community for Sherritt Gordon's copper and zinc mining operations at Ruttan mine, located 25 kilometers to the east. The planning and design of Leaf Rapids represent a unique attempt by the provincial government to participate in the development of a new northern mining community. A Crown agency, Leaf Rapids Development Corporation, was established with the task of planning, developing and designing:

> a community in the remote north that would be functional for its location, appealing in appearance, with an adequate level of community and social resources and yet compatible with the environment (Leaf Rapids Development Corporation, n.d., 3).

As a result, the town was built on a sandy esker some distance from the mine site. The vegetation at the site was preserved as much as possible thus giving the town a pleasant natural setting among pine and birch trees. Additionally, the nearby Churchill river and the many lakes

provide excellent outdoor recreational facilities for Leaf Rapids residents. A prominent feature of the community is the "Town Center". This building, which won a major architectural award[22], accommodates most of the retail and recreational facilities in the community. The Town Center also houses the hotel, health center, school, library, theater, government offices, gymnasium, curling rink, and exhibition center. A few retail and service outlets are also located at the Industrial Park at the north end of town. In total, there are 10 retail and 15 service outlets in Leaf Rapids (Manitoba, Department of Industry and Commerce, 1978b). The level of goods and services is considerably smaller in Leaf Rapids than Thompson largely due to the size differences between the communities. Some Leaf Rapids residents, in fact, utilise such services as grocery stores in Thompson on a regular basis. In addition to the road link with Thompson, a twin-engine aircraft provides a daily connection to the Thompson-Winnipeg jet service. However, the high cost of this facility precludes its use by most residents who prefer to use the road.

All housing units in Leaf Rapids are designed to be within easy walking distance of the Town Center complex. Residential streets are arranged in a peripheral fashion around the Center and pedestrian access is along wooded pathways. There is a mix of single family dwellings,

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[22] The Vincent Massey Award for Urban Excellence, 1975

townhouses, apartments and mobile homes. Planning by the Leaf Rapids Development Corporation resulted in a heterogeneous mix of housing types within the community. In an attempt to develop a more stable community, it was decided to have a higher proportion of the housing units consisting of owner-occupied, single-family dwellings rather than rental units. As a result, 60 percent of all residences are owned, an unusually high proportion for northern resource communities. Housing generally is less available than in Thompson and there is a demand for more rental units and owner-occupied mobile homes. Several new units were under construction in 1980, and there has been a recent controversial decision to develop a new mobile home park.

4.2 DATA COLLECTION PROCEDURE

The data collection was undertaken in two sequential stages:

1. a preliminary field survey;
2. the final questionnaire/interview survey.

The preliminary field investigation was conducted during the summer of 1979 when data were collected from a small sample of residents in Thompson and Leaf Rapids. This stage provided the input to the design of the final questionnaire which was administered to a larger sample of residents in the two communities during the early summer of 1980. In this section, the procedure employed in the preliminary

survey is first described. The design of the final questionnaire, with reference to the findings of the preliminary survey, is then examined. Finally, the section concludes with a description of the sampling design and questionnaire administration.

4.2.1 Preliminary Field Survey

The initial phase of the preliminary survey was to pretest the method of construct elicitation among a small sample of northern residents. On the basis of the results of the pretest, a preliminary questionnaire was then formulated and used to elicit personal constructs from a small sample of residents in both Thompson and Leaf Rapids. The purpose of eliciting these constructs is to identify constructs which are relevant to residents' images of their own community. These constructs, expressed in the form of bipolar adjectival pairs, were then to be incorporated into a rating grid in the final questionnaire. The preliminary questionnaire was also used to test the feasibility of using various response formats to obtain residents' space preferences.

During the pretest the most frequently employed method of construct elicitation, that of triad sorting, was tested[23]. This method was employed using twenty-two Canadian towns

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[23] See Chapter 3 for a discussion of the methodology associated with personal construct theory and repertory grid technique.

selected as standard elements. These included eleven northern resource towns and eleven other Canadian towns of varying size and function[24]. As the objective was to obtain constructs relevant to northern resource communities, it was considered important that these relate not only to distinctions between northern and southern communities, but also to the criteria people use to differentiate among the former.

The pretesting was conducted in Thompson, and to elicit the constructs, the ten respondents were requested to randomly select any two cards from the set of twenty-one. Each card identified one of the standard elements. The respondents were then required to complete the triad by including the twenty-second card which identified Thompson. In an environmental context, this technique is conceptually equivalent to the Self-Identification form of construct elicitation suggested by Kelly (1955). Several problems were encountered in the administration of this triad sorting format. For instance, it was found that there was a greater likelihood of selecting a triad comprised of two northern communities and one southern community than any other

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[24] Winnipeg, Manitoba; Brandon, Manitoba; Leaf Rapids, Manitoba; Saskatoon, Saskatchewan; Thunder Bay, Ontario; Dauphin, Manitoba; Fort McMurray, Alberta; Timmins, Ontario; Windsor, Ontario; Lynn Lake, Manitoba; Churchill, Manitoba; St John's, Newfoundland; Grande Cache, Alberta; Gillam, Manitoba; Sudbury, Ontario; Montreal, Quebec; Uranium City, Saskatchewan; Thompson, Manitoba. Whitehorse, Yukon; Portage la Prairie, Manitoba; Halifax, Nova Scotia; The Pas, Manitoba.

combination. This was mainly due to the fact that 50 percent of the standard elements were northern communities with Thompson always included in the triad. The resultant triads were found to produce redundant responses because subjects had problems articulating constructs other than the obvious "North-South" dichotomy. Further problems arose from the differing levels of familiarity of respondents with the selected towns, and from an apparent difficulty in simultaneously comparing three elements. On the basis of these findings, it was decided to replace the triad sorting method with a dyad format (Fransella and Bannister, 1978) in which only two elements are presented to the respondent. This simply requires the subject to state a reason for differentiating between the two elements, and is a simpler cognitive task. It also allows the retention of a large number of northern resource towns, which was thought to be desirable. The revised format used in the preliminary questionnaire also incorporated changes in the list of standard elements presented. The revised list excluded four communities which were shown during the pretest to be little known by respondents[25].

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[25] The communities included in the preliminary questionnaire as standard elements were: Thompson, Leaf Rapids, Winnipeg, Saskatoon, Brandon, St. John's, Thunder Bay, Fort McMurray, Sudbury, Gillam, Dauphin, Montreal, Whitehorse, Portage la Prairie, Halifax, Churchill, The Pas, Lynn Lake.

Responses to the preliminary questionnaire were obtained from 38 respondents (26 residents of Thompson and 12 of Leaf Rapids). The sample of residents was purposively selected to ensure that it would be reasonably representative of each community's population in terms of three attributes: occupation, sex ratio, and length of residence. Respondents were presented with a list of the seventeen place names and were asked, "In what way do you think your community is different from each of the following places?". The response identified the emergent pole of the construct. The contrast pole was identified by asking the respondent for the verbal opposite of the emergent pole (Epting, et al., 1971). Any community that was totally unfamiliar to the respondent was omitted from the list of standard elements.

The second section of the questionnaire was designed to determine an appropriate set of elements with which to elicit space preferences from northern residents. The most appropriate set of elements would then be employed in the final questionnaire to assess the study community in the context of other places. Two response formats were tested which produced data in the form of rank orderings and paired comparisons. The rank-order data are intended to reveal residents' preferences in terms of eight communities within Manitoba[26]. These communities were selected on the basis of their diverse size, function, and location. Respondents

[26] Thompson, Leaf Rapids, Winnipeg, The Pas, Brandon, Portage la Prairie, Churchill and Lynn Lake.

were asked to rank the communities in order of preference as places in which to live[27]. Paired comparisons were elicited by presenting respondents with 28 pairs of towns derived from the list of eight northern resource communities[28]. From each pair, they were asked to select the place in which they would prefer to live. Of the two formats tested, the results of the paired comparison procedure, in which only northern resource towns were compared, were least satisfactory. Respondents had few problems with the technique itself, but had difficulty making preference judgments in some cases because their knowledge of other northern resource communities was limited. Responses to the rank-order procedure were more satisfactory because all respondents were adequately familiar with the Manitoba communities and thus able to attempt preference evaluations[29].

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[27] Miller (1956) suggests that the most satisfactory results from such procedures occur if the number of objects is seven plus or minus two.

[28] Thompson, Leaf Rapids, Lynn Lake, The Pas, Grande Cache, Flin Flon, Fort McMurray, Uranium City.

[29] The decision to use a set of Manitoba communities to test the rank-order procedure, and northern resource communities to test the paired comparison method, was an arbitrary one.

4.2.2 Design of the Final Questionnaire

The final questionnaire (Appendix B) was designed on the basis of the findings of the preliminary survey. It is comprised of five sections. The first section is concerned with general socio-economic background data. In an attempt to keep the questionnaire as brief as possible, this section was confined to those variables which are considered essential for the adequate testing of the hypotheses. The questions focus on length of residence, sex, age, marital status, number of children, occupation, residence type, and form of residential tenure. The second section comprises a set of rating scales based on 46 bipolar adjectives. These scales were derived from the personal constructs elicited during the preliminary survey. A total of 360 personal constructs were elicited from the 38 respondents. Only those constructs mentioned at least three times during the preliminary survey were included in the set of rating scales (Appendix C). The constructs include both designative (e.g. large-small) and evaluative (e.g. good shopping-poor shopping facilities) aspects of the image. The adjectival scales can be arranged into four general categories:

(a) urban environment and facilities (19 categories)

(b) natural environment/northern location (8 categories)

(c) economic (8 categories)

(d) social (11 categories)

The bipolar adjectives were converted into 7-point rating scales[30]. The scales were randomised in two ways in order to prevent possible bias during presentation. Specifically, the positive and negative poles of the attributes were randomly arranged. This ensured that respondents did not automatically associate extremes on the right-hand side of the page with a negative response and extremes on the left-hand with a positive response. In addition, the order in which the scales were presented to different respondents was varied. Four different sequences of scales were presented, thus reducing bias associated with a set order. On the scales respondents were asked to describe the community where they were currently living.

The third section of the questionnaire deals with the respondents' decisions to move to a northern resource town and their intentions regarding length of stay in the community. The fourth section relates to places of previous residence. It is designed to examine the relative nature of the image and the respondent is asked to rank-order his present community in relation to other places in which he has lived. The respondent is also asked to rate his present community on a 5-point Likert-type scale from "much worse" to "much better" in relation to the community where he resided immediately before moving to Thompson or Leaf Rapids.

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[30] Scales of seven intervals were favored as they permit a "neutral" or "midpoint" rating (Osgood, et al., 1957).

The final section of the questionnaire is related to space preferences for a pre-selected set of eight communities. The selected communities comprise those towns in Manitoba which were succesfully administered during the preliminary field survey (see Figure 2). As a result of the varied origins and residential experience of migrants in northern Manitoba, they represent the only common set of communities familiar to residents. These eight communities were first rank ordered according to their residential desirability. The same communities were then presented as 28 pairs and the respondents selected the most preferred community within each pair. Although the data generated by both these techniques are basically similar, it was decided to include them both for purposes of "multiple operationism" (Downs, 1970a). This procedure provides a useful form of validation of subjective data.

4.2.3 Sampling Design and Questionnaire Administration

It was originally intended to stratify the sample of respondents on the basis of length of residence, with 50 percent of the sample consisting of residents who had lived in Thompson or Leaf Rapids for less than one year. Preliminary field investigation revealed, however, that *a priori* identification of residents on this basis was not possible due to the unavailability of relevant data. Consequently, it was decided to conduct a random sample of

all households in the communities. The most recent comprehensive data available on household addresses in the two communities is a current list of subscribers to Manitoba Telephone System. This list includes the addresses of subscribers with unlisted numbers, thus eliminating a bias that occurs with published telephone directories. Manitoba Telephone System data indicate that the household subscription level in Thompson during the study period was 76 percent[31]. In Leaf Rapids the subscription level was 83 percent. These figures are based on percentage of household units and therefore do not reflect the vacancy rates. In the case of Thompson where housing vacancies are high, the proportion of residents with telephones would be greater than the figures indicate. Of those residents who were not telephone subscribers, many are native people who are excluded from the study. After taking these considerations into account, it may reasonably be assumed that subscription levels are close to those in Winnipeg where 91 percent of households have telephones. A small under-representation of single residents may have occured due to several independent single persons living in one residence[32]. All household addresses on the list were numbered, giving totals of 4263

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[31] Personal communication with D.McIntyre, Manitoba Telephone System, March 9, 1981.

[32] In Thompson, single men living in company operated residences subscribe independently to their own telephones. In Leaf Rapids, men living in company residences are excluded as the accommodation is located at the Ruttan mine site, which is outside the community.

households in Thompson and 509 in Leaf Rapids. Sample households were selected using a table of random numbers (Lindley and Miller, 1952). In each household, the respondent was either the head of household or the spouse. In Thompson, 8.8 percent of the households were sampled and in Leaf Rapids 22 percent were sampled. This provided an entire sample of 489 households. Twenty-six of the sampled respondents were excluded because they were: (i) new immigrants who had been resident in Canada less than one year; (ii) native residents; or (iii) summer students. New immigrants and native residents were omitted from the study to avoid the difficulty of measuring diverse cultural influences on the image[33]. Additional problems of communication were also a factor in exclusion of these groups. Summer students were excluded as they were not considered to be bona fide residents. Additionally, in Leaf Rapids single men living in Sherritt Gordon's bunkhouse at the Ruttan mine site were also excluded. The mine is located 25 kilometers from the town and it was presumed that the environment here is different from that of the community.

A team of four interviewers (three in Thompson and one in Leaf Rapids) was employed to administer the questionnaire. It was left to the discretion of the interviewer to determine whether to elicit a response from the head of

[33] Lapp (1979) examines aspects of new immigrants' adjustments to northern Canadian resource towns.

household or the spouse. However, the interviewers were instructed to ensure that there were equal numbers of male and female respondents. The interviewer first distributed the questionnaire and explanatory letter to the respondent. During this initial contact the purpose of the study and the procedure for completing the questionnaire were orally explained. Each interviewer then returned at a prearranged time to collect the completed questionnaire, and handle any problems encountered by the respondent. Respondents were requested to seal the fully completed questionnaires in the envelopes provided, thus insuring an additional measure of confidentiality since the interviewers were members of the community.

A total of 463 residents[34] (357 in Thompson and 106 in Leaf Rapids) were requested to complete the questionnaire. A total of 297 questionnaires were succesfully completed in Thompson and 103 in Leaf Rapids. This represents a refusal rate of about 17 percent in Thompson and only 3 percent in Leaf Rapids.

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[34] This number does not include those residents excluded from the study for the reasons previously mentioned.

4.3 SUMMARY

The study communities of Thompson and Leaf Rapids represent two northern Manitoba resource towns that differ in terms of size, company affiliation, age of community, relative accessibility, and urban design. Data collection was undertaken in two stages. The first stage involved a preliminary survey of a small sample of residents in the two study communities. This stage was designed to elicit personal constructs relating to the study communities and also test various response formats. In the second stage, a final questionnaire was administered to a larger sample of respondents. The questionnaire incorporated the methodological findings of the preliminary survey, and included the previously elicited personal constructs in the form of bipolar adjectival rating scales. The questionnaire was presented to a random sample of 463 households in Thompson and Leaf Rapids which produced a total of 400 succesfully completed responses.

Chapter V

THE ANALYSIS: COMPOSITION OF SAMPLE AND PRESENT COMMUNITY ENVIRONMENT

In this chapter the responses of the residents of Thompson and Leaf Rapids are analysed to determine the effects of the community environment on the image. The compositions of the samples are first presented and characteristics of the respondents in the two communities are then compared. The following hypothesis is tested in two stages:

> that the dimensions of residents' images of Thompson and Leaf Rapids are related to community environment.

The first stage deals with the designative and evaluative aspects of the image based on the responses to the 46 bipolar adjectival rating scales. The second stage separately considers a specific subset of evaluation: preference. This is examined with reference to the rank-order data on preferences for selected Manitoba towns including each study community.

5.1 THE COMPOSITION OF THE SAMPLE

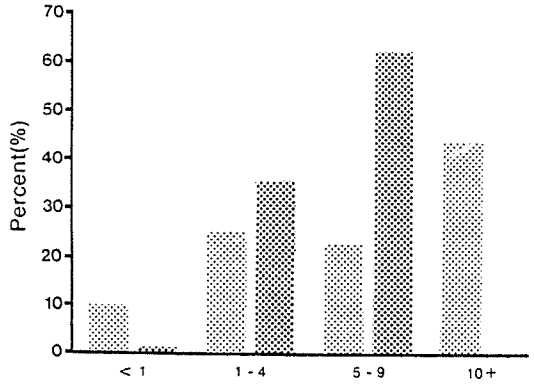
Information concerning characteristics of the interview survey respondents is organised into three categories according to the hypotheses being tested. These categories are:

1. length of residence;
2. socio-demographic characteristics;
3. residential experience and migration behavior.

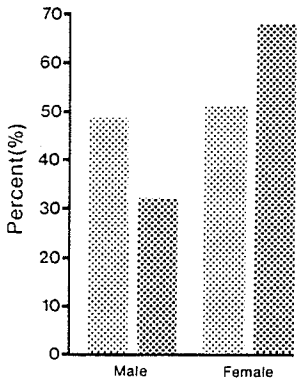
In each case, differences between the Thompson and Leaf Rapids samples are considered. These data are presented in summary form in Figures 3 and 4.

5.1.1 Length of Residence

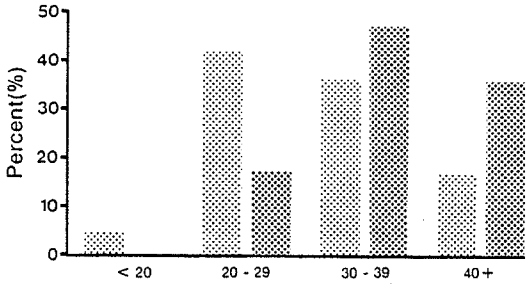
Length of residence is considered to be a major social influence upon the nature of the community image. A distinction is made in this study between "short-term residents" who have lived in the community for less than five years and "long-term residents" who have over five years of residential experience. In Thompson, 65 percent of the sample are long-term residents, while in Leaf Rapids 63 percent are in this category (Figure 3a). The mean length of residence of the Thompson sample is 9 years and for the Leaf Rapids sample it is 5 years. The differences in mean length of residence are largely a reflection of the respective ages of the communities since Leaf Rapids has only been in existence since 1973, whereas Thompson is 25



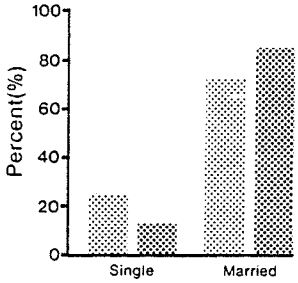
a) Years of Residence



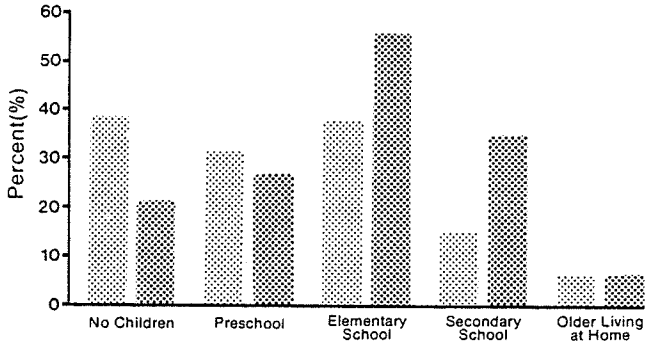
b) Sex



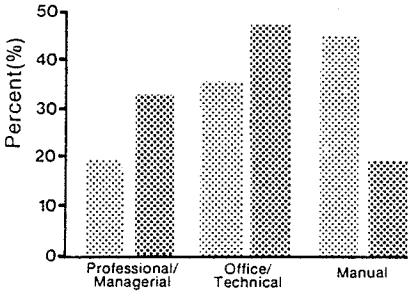
c) Age



d) Marital Status

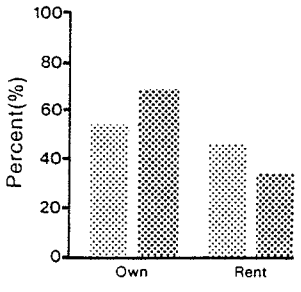


e) Family Composition



f) Occupation: Male

g) Occupation: Female



h) Form of Residential Tenure

Figure 3. Social and Demographic Characteristics of Respondents
(▒ Thompson; ▒ Leaf Rapids)

years old. In Thompson, the largest group of respondents (41.9 percent) falls within the "over 10 years" category, while in Leaf Rapids 63.1 percent of respondents are within the "5-10 year" category. These figures would seem to suggest a relatively stable population in both communities[35]. The validity of the Thompson sample as representative of length of residence within the community is substantiated by a city census conducted in June 1980. This disclosed that 56 percent of residents had lived in the city for five years or more (City of Thompson, 1980). A possible explanation for the apparent stability of the populations relates to economic factors. In the case of Thompson, the cutbacks at INCO in 1978 resulted in the redundancy of workers on the basis of seniority, with those having worked the longest period for the company retaining their jobs. Economic recovery from the cutbacks has been slow and no major influx of new residents has subsequently occured. Therefore the residual population of Thompson has "aged" in terms of length of residence over the past few years.

In the category of "short-term residents", the Thompson sample is fairly evenly distributed into length of residence categories of less than one year, 1 to 3 years, and 3 to 5 years. This is in contrast to the Leaf Rapids sample which

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[35] The relatively low rates of population mobility contrast with those which existed in 1969, when turnover was much higher (Rogge, 1973).

has only one respondent in the "less than one year" category. Although the difference reflects to some extent the hiring policy of Sherritt Gordon, it also discloses a bias in the Leaf Rapids sample that does not occur in the Thompson counterpart. In Leaf Rapids, single men living in the company-owned residence located at the Ruttan mine site, 25 kilometers to the east of the community, are excluded from the sample. It is this sector of the population (i.e. the young, single male) that has the highest level of mobility in mining communities (Canada, Energy, Mines and Resources, 1976), and is therefore more likely to have lived in the community for less than one year. In Thompson, on the other hand, company-owned residences are located within the town and their occupants are thus included in the sample[36].

5.1.2 Socio-demographic Characteristics

Socio-demographic variables include: sex, age, marital status, and number of children. An attempt was made to obtain responses from approximately equal numbers of male and female respondents. Although this was achieved in the case of the Thompson sample, about two-thirds of the Leaf Rapids respondents are women (Figure 3b). The age distributions reveal predominantly youthful samples with 84 percent of Thompson respondents under 40 years old, and 66

[36] These residences are referred to by the company as "Polaris"

percent of Leaf Rapids respondents in the same category (Figure 3c). The slightly older age structure of the Leaf Rapids sample is again probably due to the exclusion of the single (and usually younger) men living at the mine site. Figure 3d reveals that a far greater proportion of respondents in both communities is married than single. A popular misconception concerning northern resource communities is that there is a high proportion of single men[37]. However, single men do generally represent the demographic group with the highest level of turnover (Cawsey and Richardson, 1978). Therefore, if single men were aggregated in any one year they would represent a much higher proportion of residents. At any point in time, however, the most significant group of residents in Manitoba mining communities consists of "young marrieds" (Canada, Dominion Bureau of Statistics, 1971).

Further evidence of the "family" nature of the two study communities is reflected by the number of respondents with children (Figure 3e). The higher proportion of families with children in Leaf Rapids is consistent with the higher proportion of married respondents in the community. When disaggregated according to the age of the children, the older age structure of the Leaf Rapids sample is reflected

[37] A distinction should be made between the different types of mining communities (Canada, Energy, Mines and Resources, 1976) as some remote mining communities in northern Canada only provide facilities for single men. Also newer mining communities tend to have more single males during the early stages of development.

by the greater proportion of children beyond the elementary school age. Occupation of the head of the household is categorised into three general groups: professional or managerial, office or technical, and manual. These categories appear to be generally reflective of social status, as occupation may be reasonably translated into community status in a single company town. Proportionally, respondents in the three occupational categories differ between the two communities (Figure 3f). Whereas 45 percent of Thompson respondents are manual workers, only 18.5 percent of Leaf Rapids respondents fall within this category. This again largely reflects the exclusion of the miners and manual workers who live at the Ruttan mine site outside Leaf Rapids. The occupational status of female respondents or spouses of respondents, reveals that in both communities the greater proportion of women work outside the home (Figure 3g). There are few single women in the communities and the employment of wives is encouraged by the mining companies as it helps to stabilise the population[38]. In fact, studies have shown that dissatisfaction among wives who are not employed outside the home is a major factor in out-migration from resource communities (e.g. Siemens, 1973).

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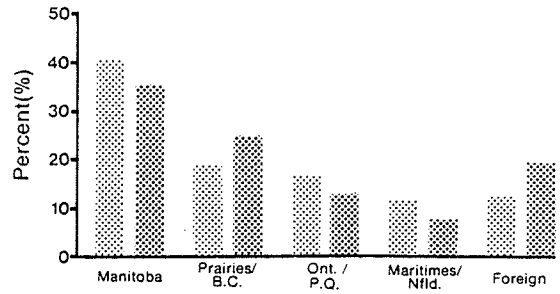
[38] Personal communication with P. Slight, Personnel Superintendent, Sherritt Gordon Mines Ltd., October 12, 1979.

One possible indicator of stability and community commitment is the form of residential tenure (Figure 3h). In the Thompson sample there are approximately equal numbers of homeowners and renters. In Leaf Rapids, however, approximately two-thirds of the respondents own their home. This is a reflection of the planning policy that was implemented in the community. In an attempt to increase residential stability, 70 percent of housing units were designed as single-family, owner-ocupied dwellings. In both communities, the greatest proportion of respondents live in single-family dwellings, although the proportion in Leaf Rapids is higher.

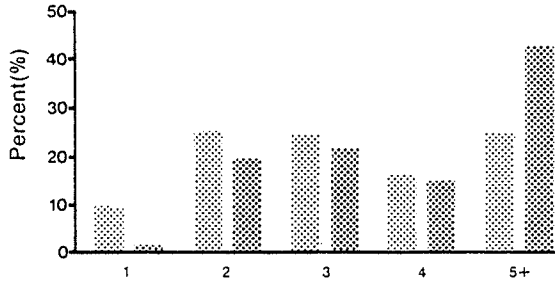
5.1.3 Residential Experience and Migration Behavior

Evaluation of the present community of residence should be influenced by past residential experience. Figure 4a indicates that approximately 40 percent of all respondents were born in Manitoba. In the case of the Thompson sample, the next most frequent places of birth are Saskatchewan and Ontario, while for Leaf Rapids residents they are countries other than Canada. The size of the community in which respondents were raised as children reveals a predominantly rural/small town background for the residents of both communities (Figure 4b). In each case, over 50 percent of the residents are from places of less than 25,000 population. The residential mobility of the samples since

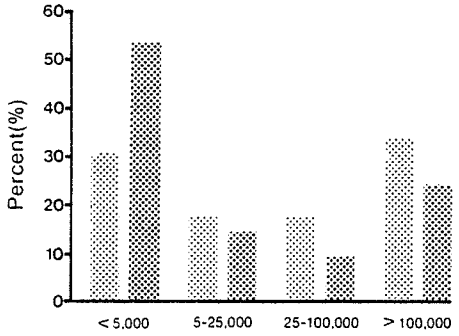


a) Place of Birth

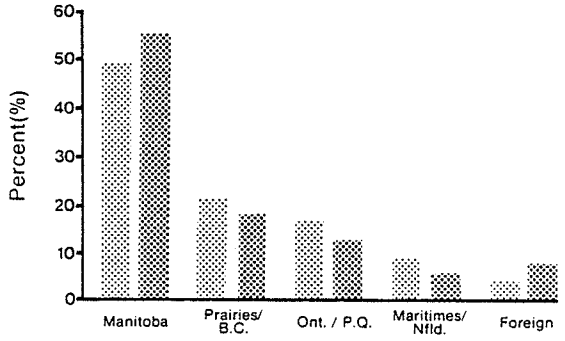
b) Size of Community in which Raised



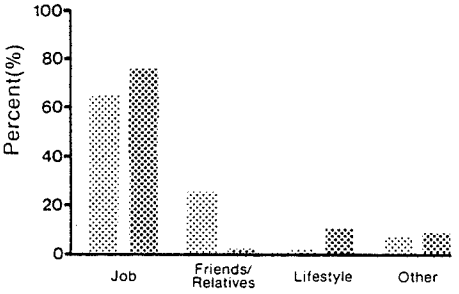
c) Total Number of Residential Moves



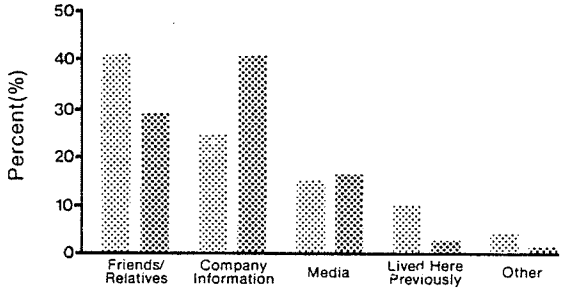
d) Size of Most Recent Prior Community of Residence



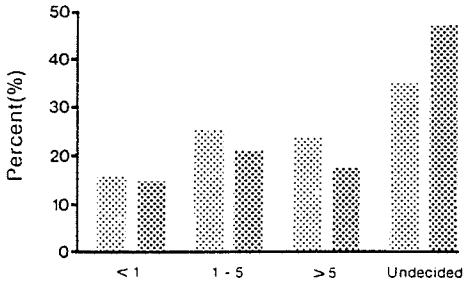
e) Location of Most Recent Prior Community of Residence



f) Reason for Moving to Present Community



g) Source of Community Information



h) Planned Length of Residence (Years)

Figure 4. Residential Experience and Migration Behavior of Respondents (Thompson; Leaf Rapids)

leaving school is shown in Figure 4c. The Thompson sample has been less mobile, with 60 percent of respondents having completed fewer than four moves compared with 43 percent of the Leaf Rapids residents. On the other hand, 43 percent of the Leaf Rapids residents have moved five of more times compared with only 25 percent of the Thompson sample.

There is also an emphasis on small town experience in terms of the size of the previous community where respondents lived immediately before moving to Thompson or Leaf Rapids (Figure 4d). Leaf Rapids residents in particular reveal a high degree of residential experience in small towns of under 25,000. In comparing these data to those concerning the size of the community in which respondents were brought up as children, however, it is clear that a substantial number have experienced life in larger communities during their adult years. For instance, while only 16.9 percent and 12.6 percent of Thompson and Leaf Rapids respondents respectively were raised in cities over 100,000, one-third of the Thompson sample and one-quarter of the Leaf Rapids respondents previously resided in a large city.

In interpreting these data one should bear in mind that the two communities differ functionally in terms of factors other than the nature of the company involved in the mining operations. In Thompson, for example, 9 percent of the labor force is employed by the provincial government, some

of whom will have relocated from Winnipeg. In addition to civil servants, there are greater numbers of teachers and hospital employees in Thompson. Many of these will also have relocated from Winnipeg after the completion of their training. Of the respondents employed by INCO, some will have moved to Thompson from the company's other major Canadian operation at Sudbury, Ontario, which is a community with a population of 100,000. Sherritt Gordon employees who have moved with the company are more likely to have relocated from the small community of Lynn Lake where a mine closure was a major factor in the subsequent development of Leaf Rapids.

The location of the previous residence (Figure 4e) discloses that approximately 50 percent of respondents in each community previously lived in Manitoba. These data reflect not only company structure but also recruitment policies. Manitoba residents are preferred employees on the grounds that greater familiarity with the environment and closer proximity to relatives appear to promote a more stable population[39]. Although Saskatchewan residents have previously provided sources of labor for northern Manitoba this trend has decreased in recent years as resource development in Saskatchewan, Alberta, and British Columbia has offered more attractive employment opportunities.

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[39] Personal communication with G. Friesen, Assistant Superintendent, Employee Relations, Inco Metals Company, Thompson, July 17, 1979.

Ontario ranks second in terms of place of previous residence for Thompson and Leaf Rapids respondents. Very small numbers of respondents have moved to the communities from Quebec and neither company actively recruits in that province. Although recruitment for labor takes place in the high unemployment areas of Newfoundland and the Maritimes, the proportions of respondents in the samples from these provinces are quite low. Recent immigrants from abroad (i.e. those living less than one year in Canada) are excluded from this study, although in both communities there has been recent hiring of skilled foreign labor due to a lack of trained Canadians.

When asked why they had moved to their present community, members of both samples usually offered job-related reasons (Figure 4f). The major differences between the two samples are that a considerably greater proportion of Thompson residents had moved to the community due to friends or relatives already living there. (In some cases they had originally moved to the community as children with their families and subsequently remained there to work.) In Thompson, the role of friends and relatives in providing information about the community is evident, with company information playing a secondary role (Figure 4g). In Leaf Rapids, the role of these two information sources is reversed, which may be a function of the relative newness of the community.

Information concerning future migration plans is difficult to assess because 34.7 percent of Thompson residents and 46.6 percent of Leaf Rapids residents were undecided about the length of time they planned to remain in the community (Figure 4h). Of those stating their intentions, about 15 percent of the entire sample in each community planned to leave within one year. However, 24 percent of Thompson respondents and 16.5 percent of the Leaf Rapids sample indicated that they planned to remain more than five years.

5.2 TESTS OF HYPOTHESIS CONCERNING COMMUNITY DIFFERENCES

The hypothesis states:

> that the dimensions of residents' images of Thompson and Leaf Rapids are related to community environment.

The basic aim in testing this hypothesis is to determine how the images held by two groups of residents reflect the objective differences that actually exist between the communities. Initially, the analysis focuses on a comparison of mean scores on the 46 bipolar adjectival rating scales (see Section 4.2.2). This provides a preliminary assessment of differences in the designative and evaluative aspects of the community images. A principal components analysis is then used to reduce these 46 variables to a smaller number of composite factors to indicate the interrelationships among the scales. To

complete the analysis of the image, the preference element is examined. A multidimensional unfolding model is applied to preference rankings of eight Manitoba communities and the resulting configuration is interpreted.

5.2.1 Analysis of Mean Scores on the Rating Scale

The 46 bipolar adjectival rating scales consist of the most commonly elicited personal constructs obtained in the preliminary field survey (see Section 4.2.1). They represent constructs used in distinguishing similarities or dissimilarities between the study communities and other Canadian towns. Thus, in accordance with the underlying personal construct theory, the scales are indicative of the ways in which people evaluate places. The data set consists of the responses to the 46 bipolar scales of 297 Thompson residents and 103 Leaf Rapids residents.

Mean scores and standard deviations on the scales are presented in Table 1 for each of the samples. The bipolar adjectival pairs have been rearranged from the form in which they were presented in the questionnaire so that favorable elements are now on the left-hand side. Where possible they are scored so that 1 represents the most positive and 7 the most negative rating, with 4 being a neutral response[40]. The mean scores represent the consensus ratings for the

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[40] In some instances there is no obvious positive or negative response, e.g., "large-small" or "fast-slow pace of life".

Table 1. Community Environment: Responses to Rating Scales

No.	Scale	Thompson (n=297) $\bar{X}$	Thompson (n=297) Sd	Leaf Rapids (n=103) $\bar{X}$	Leaf Rapids (n=103) Sd
1	Large•Small	4.19	1.16	5.39	1.23
2	Booming•Stagnant Economy	4.59	1.26	3.92	1.38
3	Good•Poor Shopping Facilities	3.76	1.51	4.95	1.57
4	Attractive•Ugly	3.07	1.29	2.39	1.29
5	Close•Far from Large City	6.34	1.31	6.10	1.57
6	Many•Few Outdoor Recreation Facilities	2.70	1.67	3.17	1.84
7	Good•Poor Night Life	4.56	1.64	5.58	1.47
8	Settled•Transient Population	4.88	1.61	6.16	1.03
9	Accessible - Isolated	4.59	1.89	4.73	1.74
10	New•Old Town	2.64	1.38	1.82	0.99
11	Wide•Little Choice of Goods or Services	4.29	1.55	5.68	1.37
12	Many•Few Job Opportunities	4.17	1.65	4.17	1.72
13	Stable•Unstable Economy	4.36	1.57	3.86	1.53
14	Pleasant•Unpleasant Natural Environment	2.78	1.42	2.13	1.45
15	Civilised•Rough	3.27	1.52	3.33	1.41
16	Compact•Sprawling Town	3.19	1.63	2.18	1.47
17	Summers Pleasant•Unpleasant	3.83	1.70	3.33	1.28
18	Winters Enjoyable •Depressing	3.97	1.77	3.59	1.67
19	Friendly•Unfriendly	2.66	1.44	3.51	1.39
20	Lots•Little To Do	3.29	1.69	3.51	1.86
21	Good•Poor Job Security	3.30	1.64	2.90	1.49
22	Mild•Cold Climate	5.71	1.31	5.47	1.32
23	Cheerful•Depressing Atmosphere	3.66	1.46	3.52	1.45
24	Cultured•Backwoods	3.85	1.48	4.21	1.29
25	Good•Poor Urban Recreation	3.34	1.60	4.33	1.77
26	Clean•Polluted Environment	3.36	1.63	2.25	1.53
27	High•Low Wages	3.51	1.40	3.15	1.47
28	Many•No Relatives	5.65	1.91	6.18	1.66
29	Fast•Slow Pace of Life	4.62	0.34	5.09	1.52
30	Well•Poorly Planned	3.18	1.57	3.39	1.79
31	Clean•Dirty	3.14	1.51	3.01	1.46
32	Low•High Crime Rate	3.70	1.46	3.17	1.49
33	Good•Poor Elementary Schools	3.23	1.77	3.42	1.78
34	Good•Poor Place for Career Advancement	4.55	1.76	4.62	1.72
35	Mixed•Working Class Structure	4.32	1.69	4.19	1.87
36	Good•Poor Transport to South	4.13	1.92	4.55	1.91
37	Exciting•Boring	3.88	1.44	4.07	1.29
38	Good•Poor Place for Quick Money	4.24	1.74	3.76	1.85
39	Short•Long Winters	6.14	1.33	6.23	1.26
40	Scenic•Ugly Location	3.36	1.67	2.15	1.47
41	Interesting•Dull People	3.14	1.44	3.41	1.38
42	Good•Poor Medical Facilities	3.59	1.71	5.14	1.86
43	Good•Poor Housing Availability	2.84	1.60	4.94	1.86
44	Low•High Cost of Living	5.07	1.44	5.44	1.42
45	Good•No Sense of Community	3.42	1.35	4.56	1.54
46	Good•Poor Secondary Schools	3.97	1.75	4.55	1.67

respondents in each community, while the standard deviations indicate the degree to which respondents are in agreement. The mean scores are presented in visual form in Figure 5 in order to facilitate comparison of the communities.

In order to clarify discussion of responses, the results are organised into four general categories concerning (a) urban environment, (b) natural environment, (c) economic factors, and (d) social factors[41]. Using this categorisation, the responses of the Thompson and Leaf Rapids residents are discussed in turn.

5.2.1.1 Thompson

In general terms, Thompson residents consider their community to be a new ($\bar{x}$=2.5), medium-sized ($\bar{x}$=4.2), and compact ($\bar{x}$=2.1) town. The community is viewed in favorable terms with respect to attractiveness, cleanliness, scenic quality, urban planning, and pollution level with all of these scales receiving positive mean ratings between 3.0 and 3.3. Relative to urban amenities and services, Thompson residents rate the availability of housing ($\bar{x}$=3.0), urban recreational facilities ($\bar{x}$=3.3), and elementary school facilities ($\bar{x}$=3.3) "above average", while the availability of nightlife ($\bar{x}$=4.5), and the choice of goods and services ($\bar{x}$=4.3) are viewed less favorably. Shopping facilities,

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[41] It should be emphasised that this categorisation is imposed by the researcher and is not related to the interrrelationships between the scales as expressed in subsequent factor analysis.

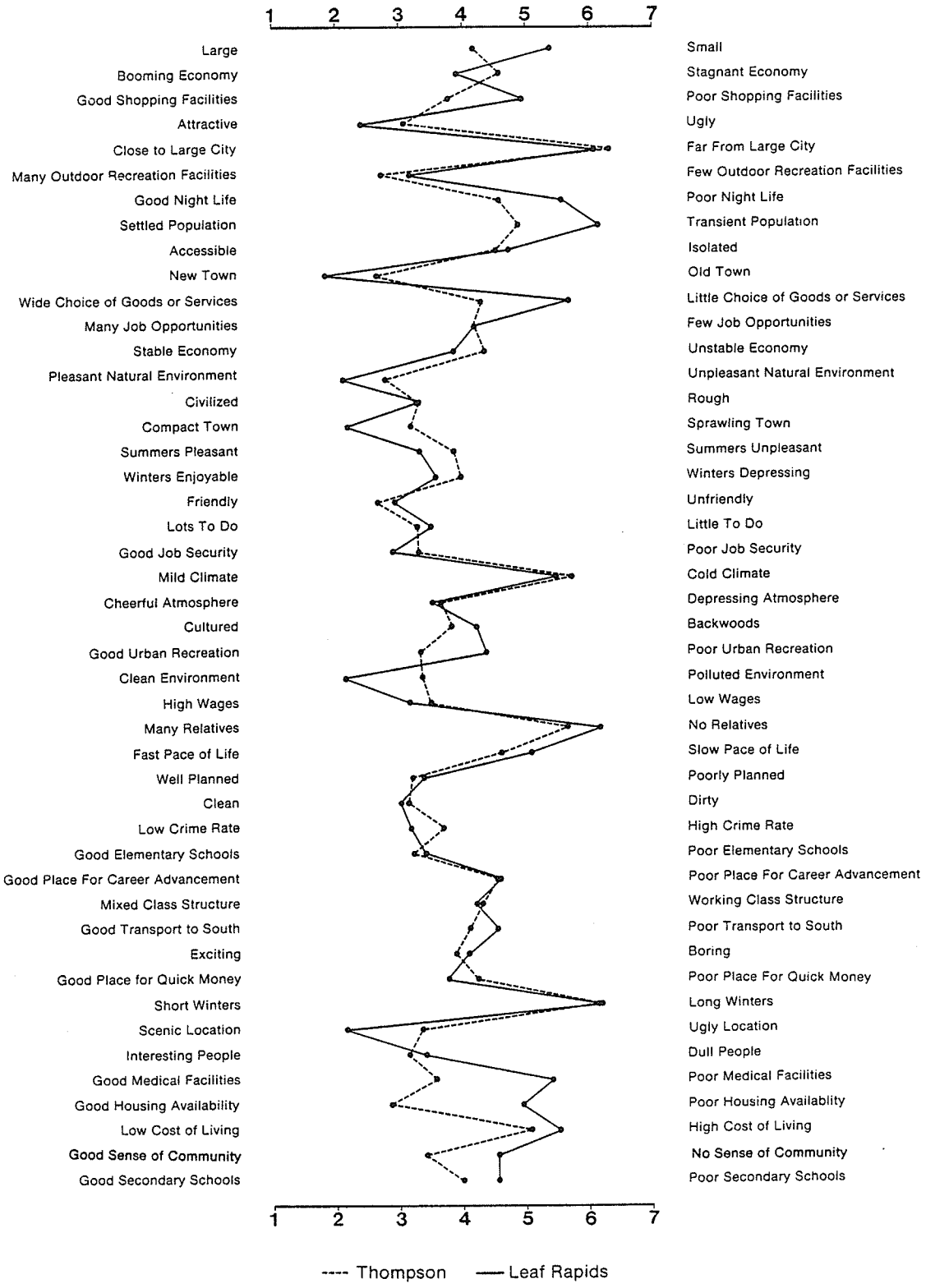

Figure 5. Community Differences: Mean Responses to the Rating Scales

crime rate, transportation to the south, and secondary schools are all given moderate ratings.

Residents of Thompson give high positive ratings to the natural environment, which they consider to be pleasant ($\bar{x}$=2.8), and providing many opportunities for outdoor recreation ($\bar{x}$=2.5). Locationally, they recognise that they are far from a major city ($\bar{x}$=6.5), but they do not consider this to imply a significant degree of isolation ($\bar{x}$=4.5). Residents consider that the winters are long ($\bar{x}$=6.3) and that the climate is generally fairly cold ($\bar{x}$=5.7), but it would appear that this does not reflect their apparent enjoyment of winter or summer, both of which are given moderate ratings.

Evaluations of the economic character of Thompson tend to be slightly negative. The general economic health of the community is viewed as somewhat stagnant ($\bar{x}$=4.5) and unstable ($\bar{x}$=4.4). Career advancement in the community is seen as rather limited ($\bar{x}$=4.5) and Thompson is not considered to be a particularly good place to make quick money ($\bar{x}$=4.3). Job opportunity is considered to be "average" ($\bar{x}$=4.1), but respondents consider job security ($\bar{x}$=3.3) and wage levels ($\bar{x}$=3.5) to be favorable. However, the cost of living is considered to be high ($\bar{x}$=5.1).

With respect to the social environment, respondents view the citizens of Thompson as residentially mobile ($\bar{x}$=4.8), friendly ($\bar{x}$=2.7), and interesting ($\bar{x}$=3.0). Few respondents

have relatives in the ccmmunity ($\bar{x}$=5.6) and there is considered to be a predcminance of working-class people ($\bar{x}$=4.2). In terms of the social lifestyle offered in the community, respondents do not generally consider Thompscn to be "rough" ($\bar{x}$=3.3) or to have a "backwoods" chararacter ($\bar{x}$=4.0). Although they view the pace of life as somewhat slow ($\bar{x}$=4.5), it would appear that, relative to other assessments of the social environment, this is not necessarily a negative evaluation. Life in the community is viewed as neither exciting nor dull ($\bar{x}$=3.9), but residents consider that there is plenty to do ($\bar{x}$=3.3). Most aspects of the social environment appear to be favorably rated, thus promoting a fairly well-developed "sense of community" ($\bar{x}$=3.3).

5.2.1.2 Leaf Rapids

Leaf Rapids respondents consider their community to be quite small ($\bar{x}$=5.4), very new ($\bar{x}$=1.8), compact ($\bar{x}$=2.2), attractive ($\bar{x}$=2.3), unpolluted ($\bar{x}$=2.2), clean ($\bar{x}$=3.0), and fairly well planned ($\bar{x}$=3.5). Their assessment of urban amenities and sevices reflects the size of the community in that shopping facilities ($\bar{x}$=5.0), nightlife ($\bar{x}$=5.5), choice of goods and services ($\bar{x}$=5.8) and medical facilities ($\bar{x}$=5.3) are all seen as relatively poor. Housing availability, although nct a direct function of the size of the community, is also judged as limited ($\bar{x}$=5.0). Transportation facilities to the south

are rated slightly below average ($\bar{x}$=4.6), as are urban recreational facilities ($\bar{x}$=4.3). The only community service judged "above" the median rating is the elementary school ($\bar{x}$=3.7), although the secondary school facilities are considered less satisfactory ($\bar{x}$=4.5). A positive community factor, however, is the crime rate, which is considered to be low ($\bar{x}$=3.2).

Leaf Rapids residents consider themselves to be far from a major city ($\bar{x}$=6.4), but only moderately isolated ($\bar{x}$=4.6). The natural environment is given a high positive rating ($\bar{x}$=2.1), as is the opportunity for outdoor recreation ($\bar{x}$=2.7). Summers and winters are both rated above the median level in terms of enjoyment, although the winters are viewed as long ($\bar{x}$=6.2) and the climate as quite cold ($\bar{x}$=5.7).

The economy of the community is assessed by residents as having "average" stability ($\bar{x}$=3.9) and being in neither a "booming" nor stagnant phase ($\bar{x}$=4.0). Leaf Rapids is also seen as a fairly good place to earn high wages ($\bar{x}$=3.2) and achieve job security ($\bar{x}$=2.9), while being slightly "above average" for earning "quick money" ($\bar{x}$=3.8). However, it is not considered to be a particularly favorable place to advance one's career ($\bar{x}$=4.5) and the cost of living is judged to be high ($\bar{x}$=5.8).

Leaf Rapids residents view the community's population as very transient ($\bar{x}$=6.2), but friendly ($\bar{x}$=3.0) and quite

interesting ($\bar{x}$=3.5). Very few people have relatives living in the community ($\bar{x}$=6.2) and the social composition of the population is thought to be only slightly "working-class" ($\bar{x}$=4.2). The pace of life is considered to be quite slow ($\bar{x}$=5.2) and only moderately exciting ($\bar{x}$=4.2). Although the residents do not consider the town to be "rough" ($\bar{x}$=3.3), they do view it as having a slightly "backwoods" character ($\bar{x}$=4.2). They also consider that the town residents do not have a very well developed "sense of community" ($\bar{x}$=4.5).

5.2.1.3 Comparison of Community Responses

The preceding results generally indicate that Leaf Rapids respondents assign more extreme values to the scales than do Thompson residents. The scales on which Leaf Rapids residents offer relatively negative ratings are in most cases related to assessment of urban amenities and services. This image is consistent with the objective environment as it reflects the service limitations associated with a small community. In a community with a population of 2,500, one would expect the adequacy of such urban amenities as shopping facilities, choice of goods, nightlife, medical facilities and transportation to be less than that in a community of 14,500. The greatest magnitude of disparity among the two sets of responses relates to medical services. This fairly reflects the objective differences in medical services between the two communities since Leaf Rapids

possesses only a Health Center, while Thompson has a fully-equipped 160-bed hospital. Educational facilities, which are more uniform within the two communities, elicit relatively similar evaluations, although Leaf Rapids respondents are less content with facilities at the secondary level. The relatively small number of children in the higher grades results in a lower level of staffing, and many parents believe that educational opportunities for high school students are limited.

Although the quality of the natural environment is rated positively by both samples, the Leaf Rapids respondents offer relatively favorable evaluations. In particular, they emphasise the general pleasantness and attractiveness of the natural environment, and the unpolluted nature of the community. Again, this would appear to be a reasonably accurate evaluation of environmental differences. Few people would disagree that Leaf Rapids is attractively sited and that the planned preservation of the natural vegetation within the community has undoubtedly enhanced its appearance. Leaf Rapids residents are also much more aware of the environmental setting as the natural and man-made milieux have been deliberately integrated. Leaf Rapids also has the advantage of being located some distance from the mine site which has no smelting facilities. Consequently, the environment is considered by many to be unpolluted. The natural environment in the Thompson area, however, is

assessed as offering slightly more favorable opportunities for outdoor recreation. This is probably a reflection of the higher level of recreational development in the Thompson district, including the provision of downhill and cross-country skiing facilities. The district also offers an extensive marina, camping and cottaging area at Paint Lake Provincial Park, and numerous other picnicking and fishing areas.

In terms of location, Leaf Rapids residents do not consider themselves to be any more isolated or distant from a major city than do Thompson residents even though an additional 220 kilometers of gravel road separates the two communities. Despite considerable differences existing between the two communities in terms of their access to the south, residents' evaluations of available transportation facilities are surprisingly similar.

In evaluating the economic aspects of the community, the mean ratings reveal some congruence with the objective facts. Thompson residents are very aware of the economic decline of the community since the INCO cutbacks in 1978 and rate economic aspects of the community fairly negatively. Leaf Rapids residents, on the other hand, suffered no recent economic decline and view their community as fairly stable in economic terms. In both communities, housing availability is a good indicator of economic health. In Thompson, there is very adequate availability of nearly all

types of dwellings, while housing is limited in Leaf Rapids. The relatively high cost of living in Leaf Rapids is recognised by its residents[42]. The higher costs of most items are due to the additional transport charges. In some cases, Leaf Rapids residents will even travel to Thompson to take advantage of lower food costs.

The population of Leaf Rapids is viewed as being more transient than that of Thompson. While this may in fact be true, it is also a reflection of the smaller size of Leaf Rapids and the consequent greater awareness of people moving to and from the community. Thompson residents rate their community as being slightly more friendly, although both communities have high positive ratings on this scale. The positive evaluation of Thompson appears contrary to the popular belief that smaller communities are friendlier. Leaf Rapids respondents also assign considerably lower ratings on the scale "sense of community" than Thompson residents. This could be indicative of the relative recency of Leaf Rapids compared to Thompson. In Thompson, some residents have lived there for over 20 years and an increasing number of young people who have been brought up there consider it to be their home.

An examination of the mean responses to the rating scale provides only a preliminary step towards understanding how residents evaluate their communities. For example, negative

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[42] Personal communication with M. Riddell, Town Manager, Leaf Rapids, October 12, 1979.

ratings by Leaf Rapids residents relating to an assessment of the level of urban services does not necessarily imply dissatisfaction, but merely a fairly accurate evaluation of actual conditions. In addition, evaluation of mean scores does not imply the relative importance of various scales. For example, in a composite assessment of the community, do Leaf Rapids residents consider the advantages of the natural environment to outweigh the disadvantages of the urban amenities?

The results reveal, however, that the images of residents in the communities do differ. Variations in the images reflect differences in the size of community and related level of urban services and amenities. They also relate to differences in the character of the natural environment and contrasts in economic health. The rather more subjective evaluations concerning the "nature of the people" are more difficult to interpret, but it is perhaps surprising to find that these are more negative in the smaller community. The only results that appear inconsistent with the objective environment are assessments of the degree of isolation, distance from the major city, and adequacy of the transportation facilities to the south. In both communities, residents consider themselves to be located far from a major city but, in neither case do they consider themselves to be particularly isolated. This may be due to the fact that, largely through the local media, residents

are made aware of extremely isolated communities in northern Manitoba to which access is solely by light aircraft. Therefore, they use such communities as extreme poles of isolation when making their judgments.

The results of the mean responses to the rating scales appear to reveal fairly predictable responses. For example, Leaf Rapids residents rate their community as smaller, and the related level of urban services as less adequate than do Thompson residents. The significance of such apparently obvious findings lies in the relative nature of judgments. Judgements are conceptualised as being made along a bipolar scale (Kelly, 1955) on which the polar extremes are defined by each individual according to a frame of reference (Helson, 1964; Wolpert, 1965). When comparing responses from residents in the two communities, the overall impression is one of general consistency between the image and the objective environment. This would appear to suggest that respondents, despite varied backgrounds, employ a common frame of reference which includes adjacent communities.

A more detailed scrutiny of the responses, reveals some discrepancies in the magnitudes of the responses. For example, the mean response to the "accessible/isolated" scale for Leaf Rapids respondents is 4.73, compared with a mean response of 4.59 for Thompson residents. When viewed from an external perspective, the results appear

inconsistent with the objective environment, since it might have been anticipated that Leaf Rapids residents would consider their community to be more isolated. Similar apparent inconsistencies are evident on a variety of other scales such as the "distance from a large city", "transportation facilities to the south", and even "size". The mean response of Leaf Rapids residents on the "size" scale reveals, as expected, higher scores than those of Thompson respondents (5.39 and 4.19 respectively). It may be argued, however, that this does not accurately reflect the difference between towns with 2,500 and 14,500 populations. These findings perhaps suggest that some form of "sliding scale" exists with the home community seen as the norm. As a result it is located approximately in a central position on the rating scale. Thus, in assessing community size, a Thompson resident may employ Leaf Rapids as a "reference community" which is smaller than the "home community", and Winnipeg as one which is larger. Likewise, Leaf Rapids residents may not view their own community at an extreme pole of the size continuum. Instead, they may rate Leaf Rapids in relation to an even smaller northern community (e.g. Nelson House), and perhaps employ Thompson as a larger "reference community".

5.2.2 Principal Components Analysis of the Rating Scales

In order to reduce the data from the 46 rating scales and reveal the relationships that exist between the variables, principal components analysis is employed[43]. This technique is selected because no assumptions are made concerning the general structure of the variables. It is therefore best suited to the exploratory nature of many of the hypotheses. In addition, the inter-correlated nature of many of the variables restricts the application of other factoring methods (Kim, 1970).

Principal components analysis is separately carried out for each of the Thompson and Leaf Rapids data sets. The first stage of the analysis involves computation of an R-mode correlation matrix indicating the degree of correlation between the variables[44]. In the principal components model the principal diagonal of the correlation matrix is represented by unities indicating that all the variance is accounted for by the 46 variables (Yeates, 1974). Components are then calculated with the first component being the one that represents the best linear

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[43] Principal components analysis was carried out on the University of Manitoba's AMDAHL V/7 computer using SPSS subprogram FACTOR, procedure PA1 (Nie, et al., 1970).

[44] There are two modes of factorial analysis, Q-mode which compares variations between rows (in the present study each row represents each individual's response) and R-mode analysis, which analyses variation between columns (Yeates, 1974). As the concern of the present analysis is to analyse variation between the variables, R-mode analysis is used.

combination of variables and accounts for the greatest proportion of the total variance. Subsequent components are extracted orthogonally, each representing the best explanation of residual variance not accounted for by preceding components (Kim, 1970).

In order to obtain simpler and more readily interpretable results, the initial sclution is rotated. Components with an eigenvalue of greater than 1.0 are retained for rotation using a varimax orthogonal solution[45]. This method:

> "seeks to maximise the variance of the loadings on each factor, that is to achieve as many high and as many low loadings as possible" (Goddard and Kirby, 1976, 27).

In the solutions for the Thompson and Leaf Rapids samples, 14 and 15 components, respectively, have eigenvalues greater than 1.0 and are thus retained for rotation[46]. An arbitrary decision was made to use factor loadings of ±0.5 as the level for intepretation of the components, although values lower than this are used to aid interpretation where necessary. Tables 2 and 3 contain summaries of the factor loadings employed to interpret the components[47]. The

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[45] The varimax orthogonal rotation is selected, rather than an oblique rotation, because of the exploratory nature of the inquiry. Oblique solutions require greater knowledge of anticipated results, in order to determine the angle of rotation.

[46] Although several more sophisticated means of determining the number of factors to be retained does exist, the use of an eigenvalue of 1.0 is a frequently employed criterion, and has been demonstrated to be as acceptable as other techniques (Kim and Mueller, 1978).

[47] Complete listings of factor loadings are included in Appendix D.

greatest emphasis is placed on interpretation of those components which account for at least 5 percent of the total variance.

5.2.2.1 Thompson

The large number of components (14) that have been extracted with eigenvalues greater that 1.0 is indicative of the extremely complex structuring of Thompson's place imagery (Table 2). The first component extracted explains the greatest amount of variance (16 percent) and the final component explains 2.2 percent. Only the first two components explain over 5 percent variance each, although the 14 components together account for 59.2 percent of the total variance.

The first component explains 16 percent of the total variance. The scales which load strongly onto this component relate both to the physical environment (i.e. natural environment, urban planning, and overall attractiveness), and to the social environment (friendliness, and the "civilised" nature of the community). This component is therefore labelled "Community Environment". The combined physical and social attributes associated with this component indicate the composite nature of the community evaluation. This suggests that overall community evaluation will not be high unless satisfactory

Table 2. Summary of varimax-rotated component loadings: Thompson respondents

	Component	Loading	Total variance explained
1.	Community Environment		16.0%
	14. pleasant-unpleasant natural environment	0.71	
	30. well-poorly planned	0.61	
	15. civilised-rough	0.61	
	4. attractive-ugly	0.59	
	19. friendly-unfriendly	0.59	
2.	Social Activity		6.3%
	18. winters enjoyable-depressing	0.67	
	37. exciting-boring	0.62	
	20. lots-little to do	0.56	
	23. cheerful-depressing atmosphere	0.56	
3.	Urban Amenities		4.3%
	11. wide-little choice of goods or services	0.64	
	7. good-poor nightlife	0.57	
	29. fast-slow pace of life	0.53	
4.	Size-related Amenities		
	3. good-poor shopping facilities	0.63	3.9%
	1. large-small		
	43. good-poor housing availability	0.54	
5.	Sense of Community		3.7%
	32. low-high crime rate	0.73	
	31. clean-dirty	0.56	
	45. good-no sense of community	0.49	
6.	Economic Opportunity		3.3%
	12. Many-few job opportunties	0.65	
	34. good-poor place for career advancement	0.58	
	26. clean-polluted environment	0.49	
7.	Educational Concerns		3.1%
	32. good-poor elementary schools	0.70	
	5. close-far from large city	-0.57	
	46. good-poor secondary schools	0.46	
8.	**********		3.1%
	8. settled-transient population	-0.64	
	16. compact-sprawling town	0.62	
9.	**********		3.0%
	6. many-few outdoor recreation facilities	-0.48	
	10. new-old town	-0.47	
10.	Economic Health		2.8%
	2. booming-stagnant economic	0.78	
	13. stable-unstable economy	0.64	
11.	Financial Opportunity		2.5%
	38. good-poor place for quick money	0.79	
	27. high-low wages	0.65	
12.	Cost of Living		2.5%
	44. low-high cost of living	0.78	
13.	Nearness to Relatives		2.4%
	36. good-poor transport to south	0.64	
	28. many-no relatives	-0.53	
14.	Class Structure		2.2%
	35. mixed-working class structure	0.83	

levels exist for both of these aspects. The inference in planning terms is that social planning is equally as important as physical planning in achieving high levels of residential satisfaction.

The second component, which accounts for 6.3 percent of the variance, has four scales with strong positive loadings: the enjoyment of winter, lots to do, cheerfulness, and excitement. It is thus labelled "Social Activity" as it relates to the social lifestyle in the community. It is of particular interest that the enjoyment of the winter season has a strong positive loading on this component. A common aspect of the popular stereotyped images of non-residents of northern resource communities is the belief that the winters are very unpleasant. In Thompson, much social activity occurs during the winter months together with recreational activities which include curling, ice hockey, and skiing. It is likely that residents expect winters to be long and cold and are therefore prepared to accept this aspect of the northern environment. On the other hand, a wet cold summer which prevents residents from taking advantage of the many outdoor recreational activities in the area is likely to be a more common reason for discontent with the environment[48] Components 3 and 4 both relate to urban amenities. Component 3, which accounts for 4.3 percent of the variance,

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[48] Personal communication with G. Friesen, Assistant Superintendent, Employee Relations, Inco Metals Company, Thompson, July 17, 1979.

is defined by scales associated with the nightlife, choice of goods, and the pace of life. It is labelled "Urban Amenities". Component 4 explains 3.9 percent of the variance and appears to relate to size and urban amenities. The implications of this component are that shopping facilities and housing availability are covariant with community size. The size of the community is closely related to the availability of commercial services, but in the case of Thompson the present housing availability is a function of economic decline and out-migration. Component 4 is labelled "Size-Related Amenities". Component 5 (3.7 percent of total variance) is labelled "Sense of Community" as the scales with the strongest loadings are: crime rate (0.73), cleanliness (0.56), and sense of community (0.49).

Component 6 represents the first to be extracted that is associated with economic aspects of the community. Labelled "Economic Opportunity", it explains 3.3 percent of the variance. Component 7 (total variance 3.1 percent) has scales with strong positive and negative loadings. Distance from the city has a loading of -0.57, while positive loadings relate to elementary (0.70) and secondary (0.46) school facilities. The relationship between these scales is not obvious and they may be unrelated. The remaining seven components are less significant and have strong loadings on only one or two scales. Components 8 and 9 are not interpreted. However, Components 10, 11, and 12 all relate

to economic aspects of the community such as "Economic Health" (Component 10), "Financial Opportunity" (Component 11) and "Cost of Living" (Component 12). In total these three components account for 7.8 percent of the variance. The last two components are social in character. Component 13 relates the number of relatives in the community to transportation to the south. This implies that communications to the south are viewed largely in terms of family accessibility. The final component has a strong loading on only one scale, class structure.

5.2.2.2 Leaf Rapids

For the Leaf Rapids sample 15 components are rotated and explain 70 percent of the total variance (Table 3). Of these, the first four components each explain variances in excess of 5 percent. The first component explains 15.5 percent of the variance, and five scales have strong positive loadings on it: outdoor recreation, nightlife, winter enjoyment, lots to do, and excitement. This factor is labelled "Social Activity" as it comprises all aspects of the social lifestyle within the community and the surrounding area. The implication is that community satisfaction is a function of the amount of social and recreational opportunity available. The inclusion of winter enjoyment with a loading possessing the same sign as such scales as excitement and outdoor recreation is an

Table 3. Summary of varimax-rotated component loadings: Leaf Rapids respondents

	Component	Loading	Total variance explained
1.	Social Activity		15.5%
	18. winters enjoyable-depressing	0.72	
	20. lots-little to do	0.72	
	6. many-few outdoor recreation facilities	0.70	
	37. exciting-boring	0.65	
	7. good-poor nightlife	0.55	
2.	Physical Environment		8.9%
	14. pleasant-unpleasant natural environment	0.76	
	4. attractive-ugly	0.75	
	30. well-poorly planned	0.60	
3.	Location/Size		5.4%
	22. mild-cold climate	0.77	
	1. large-small	0.49	
	5. close-far from large city	0.48	
	16. compact-sprawling town	0.47	
4.	Urban Amenities		5.3%
	3. good-poor shopping facilities	0.74	
	46. good-poor secondary schools	0.62	
	1. large-small	0.58	
	11. wide-little choice of goods or services	0.55	
5.	Family Environment		4.4%
	32. low-high crime rate	0.74	
	19. friendly-unfriendly	0.54	
	43. good-poor housing availability	-0.53	
6.	Cultural Environment		4.3%
	24. cultured-backwoods	0.72	
	35. mixed-working class structure	0.59	
	29. fast-slow pace of life	0.46	
7.	Community Friendliness		3.6%
	19. friendly-unfriendly	0.73	
	17. summers pleasant-unpleasant	0.65	
8.	Economic Opportunity		3.5%
	34. good-poor place for career advancement	0.73	
	12. many-few job opportunities	0.70	
9.	Economic Character		3.1%
	13. stable-unstable economy	0.77	
	15. civilised-rough	0.52	
	27. high-low wages	0.51	
10.	Transportation to South		3.0%
	36. good-poor transport to south	0.69	
11.	Resource Town Character		3.0%
	26. clean-polluted environment	-0.65	
	28. many-no relatives	0.63	
	38. good-poor place for quick money	0.50	
12.	Community Quality		2.8%
	31. clean-dirty	0.80	
	15. civilised-rough	0.47	
13.	Job Security		2.6%
	21. good-poor job security	0.72	
	40. scenic-ugly location	0.54	
14.	Medical Facilities		2.4%
	42. good-poor medical facilities	-0.84	
15.	Population Transience		2.2%
	8. settled-transient population	0.81	

indication that, as in the case of Thompson residents, Leaf Rapids residents do not view winter as a negative aspect of their environment.

Component 2 is labelled "Physical Environment" and explains 8.9 percent of the variance. Three scales have strong positive loadings on this component (natural environment, planning of the community, and community attractiveness). Component 2 appears to reflect the response of Leaf Rapids residents to aspects of the planning of the town, which endeavored to integrate the built and natural environments. Residents are thus not only aware of the natural environment, but associate it with the attractiveness of the community. The third component explains 5.4 percent of the variance. Only one scale has a factor loading greater than 0.5 (climate 0.73), although three other variables: size (0.49), distance from a large city (0.48), and the compactness of the community (0.47) have loadings marginally below this value. The positive loadings of climate and distance from the city may imply that these scales are both viewed from a locational perspective. For instance, "distance from a large city" is probably interpreted as "distance north". However, there appears little relation between these and the other two size-related components. A possible interpretation is that location and size do represent frequently utilised general place attributes which people use in evaluation processes.

For example, residents would perhaps broadly characterise Leaf Rapids as a small mining town, 1,000 kilometers north of Winnipeg. General information about size and location is often utilised by people to make further inferences about the nature of places such as the level of service provision and climate. No appropriate label can be found to combine these two aspects, however, and the component is thus named "Location/Size".

Some of the notions associated with size are also indicated in Component 4, which explains 5.3 percent of the variance. In this case, size is associated with the level of urban services and is labelled "Urban Amenities". Also loading on this component are shopping facilities and choice of goods. Component 4 thus implies that residents recognise that the availability of public and commercial services in Leaf Rapids is a function of the size of the community. Each of the remaining components accounts for less than 5 percent of the total variance. Component 5 explains 4.4 percent of the variance. Three apparently unrelated scales: friendliness, crime rate, and housing availability, load on this component. If one takes into account the high proportion of married female respondents, then these scales may be seen as constituting elements of a community associated with the suitability of the environment for raising a family. The component is thus labelled "Family Environment".

Components 6 and 7 are both associated with the social environment. Component 6 is labelled "Cultural Environment" and explains 4.3 percent of the total variance, while Component 7 is labelled "Community Friendliness" and explains 3.6 percent of the variance. The loadings on the latter component imply that friendliness is associated with the pleasantness of the summer thus, emphasising the social interaction that occurs in conjunction with summer recreational pursuits. The next four components all relate in some way to the "frontier" resource character of the community. The first two components (Components 8 and 9) express the economic opportunity offered by the community, with a combined explanation of 6.6 percent of the total variance. Components 10 and 11, each accounting for 3 percent of the total variance, relate primarily to transportation to the south and the number of relatives in the community. The remaining four components are each defined by loadings of only one or two scales which relate to "Community Quality" (Component 12), "Job Security" (Component 13), "Medical Facilities (Component 14), and "Population Transience" (Component 15).

5.2.2.3 Comparison of Community Responses

A comparison of the components extracted from the two analyses reveals some overall differences in residents' images of Thompson and Leaf Rapids. The most significant is

the greater emphasis that Leaf Rapids residents place on their social activities. On the other hand, the principal component elicited from the responses of Thompson residents incorporates both physical and social aspects of the community. Social activity is expressed only in terms of the second component extracted for Thompson respondents. This may reflect size differences between the communities. In a small community, the quality of the personal social environment assumes greater importance than in a larger community where community services reduce dependence on such factors in an overall assessment of the quality of life. Not unexpectedly, Leaf Rapids residents reveal greater awareness of the natural physical environment and frontier nature of their community than Thompson residents. This appears to relate to the immediate proximity of the natural environment at Leaf Rapids. Conversely, Thompson residents live in an urban milieu and may, if they so choose, have relatively little contact with the natural environment of northern Manitoba.

These findings add support to those of Demko (1974) in suggesting that social and environmental concerns dominate place evaluation. They further suggest that the relative importance of these attributes may be a function of community size.

5.2.3 Preference Analysis

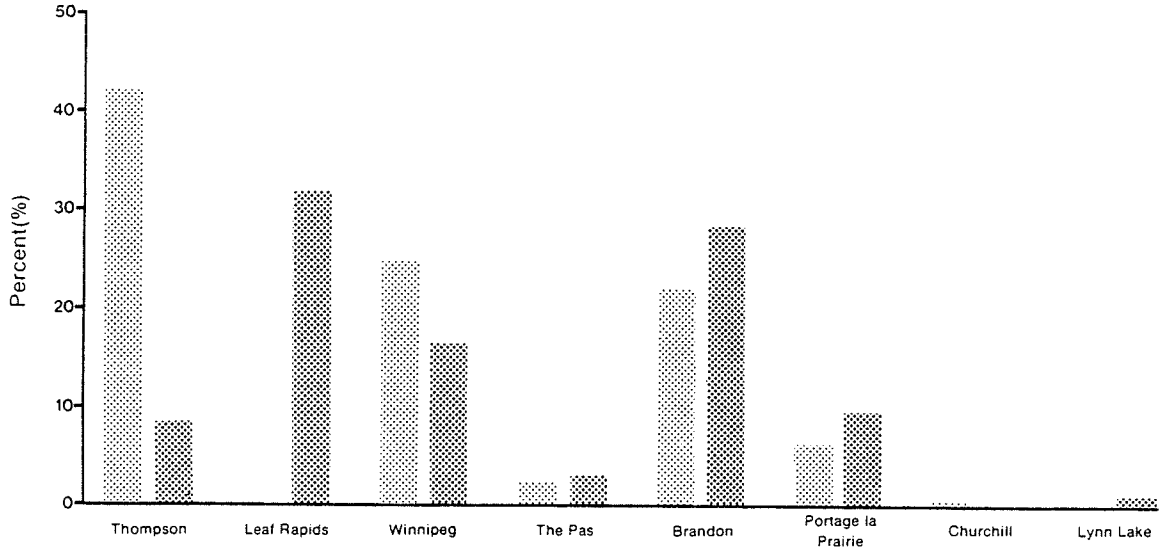
Examination of the image has thus far focused on how residents view their community in terms of a common set of attributes. In this section, the hypothesis concerning community differences is tested with reference to preference. The preferences disclose how respondents rank-order their own community with reference to other Manitoba towns. Preference is a subset of evaluation, and an important input to spatial decision-making and overt behavior (see Figure 1)[49]. A separate data set is analysed to reveal the dimensions employed in preference judgments and consists of rank-orderings of eight Manitoba towns in terms of their residential desirability[50]. The preference rankings are first presented in descriptive form and a preliminary analysis is carried out. These data are then analysed using MDS techniques in an atttempt to reveal the underlying dimensions of preference judgments of places.

5.2.3.1 The Preference Profiles

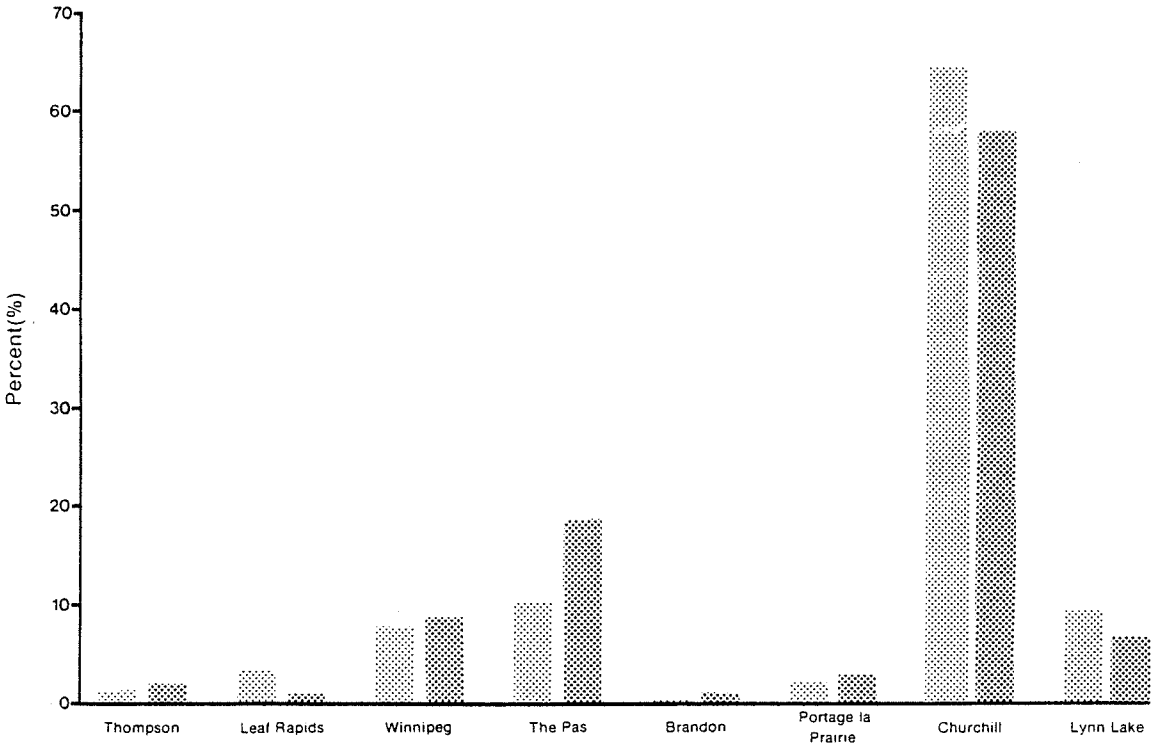
An examination of the first and last preferences of respondents for the eight selected Manitoba towns offers an initial basis on which to examine place preferences (Figure 6). Consistent with the findings of previous investigations

[49] A fuller discussion of the conceptual relationship between preference and evaluation is given in Chapter 1.

[50] Although preference data were collected in the form of both rank orders and paired comparisons, the former data set was more complete.



a) First Preference



b) Last Preference

Figure 6. Community Differences: First and Last Preferences for Selected Manitoba Communities

of place preference (e.g. Gould, 1966), many residents express a high degree of preference for their own community. However, in comparison to Thompson residents, fewer Leaf Rapids respondents rank their "home community" as first choice (31.9 percent compared to 42.1 percent respectively). For Thompson respondents, Winnipeg and then Brandon are the next most frequently mentioned first choice. Leaf Rapids residents, on the other hand, state a preference for Brandon much more frequently than they do for Winnipeg, the latter being the third most frequently selected first choice. Although 8.4 percent of Leaf Rapids residents rank Thompson as their most preferred community, no Thompson respondent ranks Leaf Rapids as first choice. Lynn Lake and Churchill, the two most northerly communities, are rarely assigned a first choice ranking by respondents of either community. At the opposite end of the preference scale, very few respondents select their "home community" as final choice. Churchill is ranked as last choice by the majority of respondents in both communities. The next least preferred community for both groups is The Pas.

An overview of the extremes of the preference rankings indicates some general patterns. The difference in evaluation of the "home community" appears significant, with more Thompson residents expressing a preference for the community in which they presently live. Leaf Rapids residents appear more frequently to express a preference for

medium-sized southern Manitoba towns such as Brandon and Portage la Prairie. A possible explanation for these findings relates to the differences in the size of the two communities. Thompson residents express satisfaction with such size-related factors as the provision of goods and services, shops, medical facilities and schools in the community. To a certain extent, the lifestyle in Thompson is not unlike that in any community further south. Contact with a "northern" environment and adoption of a "northern" lifestyle is regarded as a matter of choice for the resident. Residents of Leaf Rapids, on the other hand, express dissatisfaction with the level of many community services. This implies that they may view the town as being too small.

In addition to size-related factors, the relative ages of Thompson and Leaf Rapids offer a possible explanation for differences among residents ranking of their own community. Thompson has existed for 25 years and demographically bears a much closer resemblance to southern communities than it does to other northern resource towns (Manitoba, Department of Municipal Affairs, 1980). Many respondents have lived in the community for over 10 years and consider it to be their "home". Furthermore, the principal component extracted from the rating scales of Thompson residents is termed "Community Environment" and subsumes a combination of physical and social attributes. It would appear that positive

evaluations of both the physical and social attributes of the community are necessary for high levels of residential satisfaction. There appears little doubt that residents of both communities enjoy the physical environment. Leaf Rapids residents, however, are less content with the social environment and rate their community lower on such scales as "transience of population" and "sense of community" than do the Thompson sample. The importance of satisfaction with social characterisics is further revealed in the principal component extracted from Leaf Rapids respondents; it is labelled "Social Activity".

5.2.3.2 Multidimensional Scaling Analysis of Preference

The preceding description of preference rankings offers a limited basis on which to make inferences concerning the underlying dimensions upon which evaluations of places are based. Although an examination of the extremes of the preference rankings provides a basis for interpretation, it is difficult to consider adequately the entire range of responses. In addition, the mean preference scores mask significant differences. Multidimensional scaling techniques provide a means of visually representing the entire structure of the data set in spatial form (Shepard, 1972).

Multidimensional scaling techniques seek to convert proximities data (which measure degrees of similarity or

preference among objects) into a configuration of points in Euclidean space so that the smallest possible dimensionality is achieved (Kruskal and Wish, 1978). The general procedure is based on the assumption that objects can be expressed as points in n-dimensional space, where n represents the number of actual or perceived attributes possessed by an object. The magnitude of each attribute associated with an object can then be interpreted as a geometric coordinate. On this basis, the coordinate values for all attributes determine the location of the object in the n-dimensional space (Golledge and Rushton, 1972). The coordinates of points are adjusted by iterations so that interpoint distances of the entire configuration correspond as closely as possible to the proximities (Kruskal and Wish, 1978). A measure of "gooodness of fit" is calculated after each iteration indicating the degree of improvement in the relationship between the interpoint distances and the proximities[51]. The procedure continues until the minimum stress for the data in a given dimensionality is achieved. Interpretation of the resulting spatial configuration of objects in the "psychological space" then reveals the hidden dimensions upon which the judgments of similarity or preference are made.

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[51] A commonly used measure is "Stress" which measures the square root of a normalised "residual sum of squares" (Kruskal and Wish, 1978, 49). In the present analysis "Sstress", a formula based on squared distances is utilised (Takane, Young, and deLeeuw, 1977).

A major advantage of MDS is that the dimensions along which respondents make judgments are independent of bias introduced by the researcher. However, interpretation of the resulting configuration and the identification of these dimensions is subjective and frequently problematic (Shepard, 1972; Kruskal and Wish, 1978). Nevertheless, if multiple operationism is applied, and the configuration is interpreted with reference to an alternate interpretation of the data, then MDS provides a useful tool for further elucidating cognitive processes.

A variety of MDS procedures has developed to analyse various types of data[52]. The procedure used in the present research is ALSCAL, (Young, Takane and Lewyckyj, 1977)[53] a comprehensive MDS program that incorporates options for a variety of nonmetric multidimensional and unfolding programs. It employs the alternate least squares approach to scaling proposed by Takane, Young and deLeeuw (1977) and improved by Young, Takane and Lewyckyj (1978). The ALSCAL procedure performs an analysis of the ordinal level preference rankings in the present study, which corresponds to the multidimensional unfolding proposal formulated by

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[52] Some of the most widely used programs include: TORSCA (Young and Torgerson, 1967), MDSCAL (Kruskal, 1964), and INDSCAL (Carroll and Chang, 1970). Reviews of these and other techniques can be found in Shepard et al. (1972); Golledge and Rushton, (1972); and Green and Rao (1972).

[53] PROC ALSCAL (Version 4.3, 1981), the Statistical Analysis System (SAS) procedure version of ALSCAL was employed (SAS Library Supplement, SAS 79.5, 1980).

Coombs (1964)[54] (Young and Lewyckyj, 1979). In this study, the input data are organised in the form of a single rectangular matrix with columns representing the eight communities (cf. objects) and rows representing the respondents[55]. Both places and subjects are ultimately represented as points in the joint multidimensional Euclidean space. Subjects are plotted to represent their "ideal location" and, for any individual, one can judge how this location relates to the configuration of communities. In the present analysis, however, emphasis is placed primarily on the interpretation of configuration of the places without reference to the ideal points.

Preference rankings of respondents in Thompson and Leaf Rapids are analysed separately. For each of the communities, a random subsample of subjects is obtained from the entire sample. Each subsample consists of 30 subjects which represent approximately 30 percent of the Leaf Rapids respondents and 10 percent of the Thompson respondents. For both communities, several solutions using differing

[54] The model employed is the Joint Euclidian model which is shown in Appendix E.

[55] Most multidimensional scaling analyses have been carried out using small sample sizes, usually less than 60 subjects (e.g. Burnett, 1973, Demko, 1974, Palmer, 1978). This is due the limited capacity of many programs. Although ALSCAL can handle larger samples than most programs, it was decided that greater confidence could be placed on the resulting configurations if smaller subsamples of respondents were used. Other problems associated with the multidimensional analysis of large data sets are discussed in a recent book edited by Golledge and Rayner (1982).

dimensionalities are computed. The two-dimensional configurations presented in Figure 7 represent the most readily interpretable sclutions. Although the stress values are slightly reduced by employing higher dimensional solutions, interpretation is rendered much more difficult[56]. In order to aid interpretation of the two dimensional configurations, reference is made to the relevant personal constructs elicited in the preliminary field survey[57]. These constructs indicate ways in which a sample of residents consider their home community to be different from the same eight communities that are rank-ordered (Appendix C). The constructs may therefore be externalizations of a similar cognitive structure to that which underlies the MDS configuration.

Interpretation of the configurations is based primarily on analysis of "neighbourhoods" or clusters (Kruskal and Wish, 1978) as opposed to dimensions as this approach appears to offer more readily interpretable solutions. The two-dimensional configuration of the preference responses of Leaf Rapids residents is discussed first as this appears

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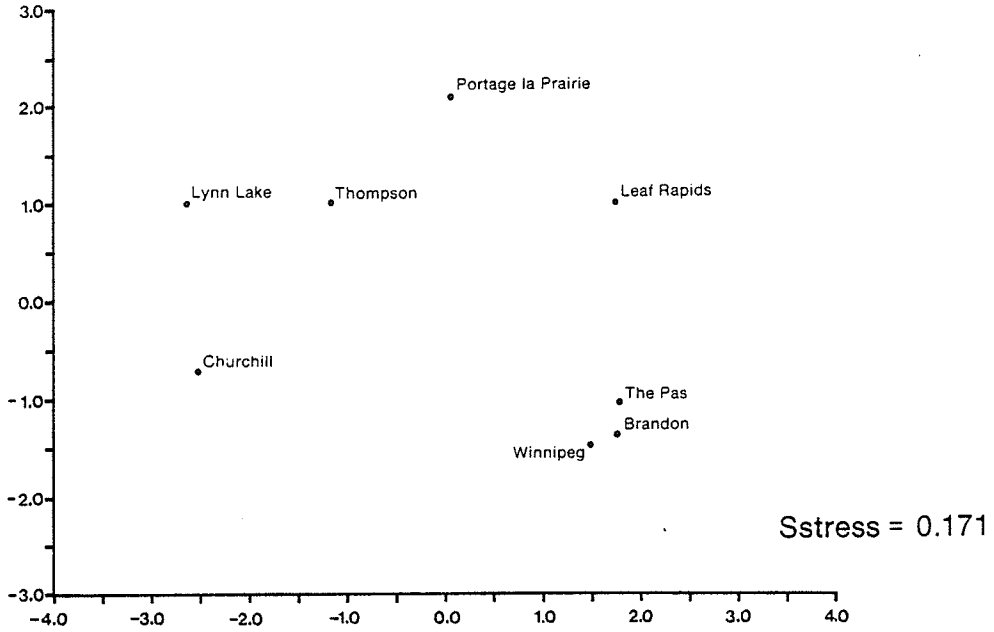
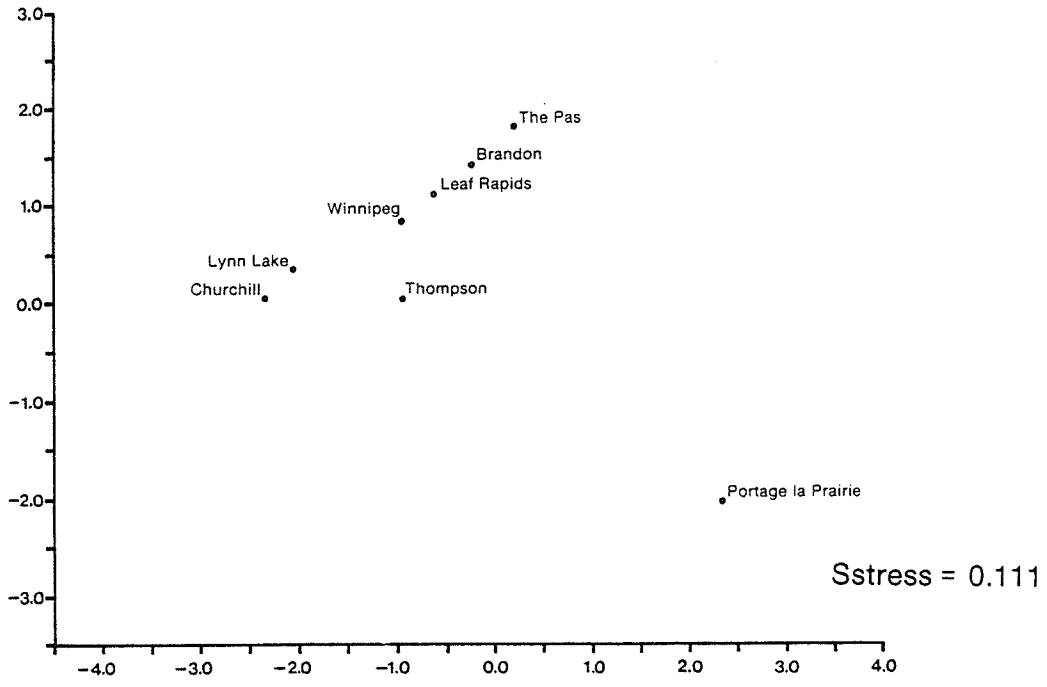
[56] Kruskal and Wish (1978) support ease of interpretation as a valid reason for choice of dimensionality. They also state that stress values are unreliable if the number of objects is less than four times greater than the number of dimensions. In the present research, the maximum number of dimensions for which stress values are reliable is in fact <u>two</u>.

[57] The utilization of the repertory grid technique in the interpretation of MDS configurations is advocated in research by Palmer (1978).



a) Leaf Rapids



b) Thompson

Figure 7. Community Differences: Two-Dimensional Preference Configurations

easier to interpret (Figure 7a). The configuration of Thompson residents' preferences is more difficult to interpret, but some general inferences are attempted (Figure 7b). Finally, some possible reasons are suggested to account for problems encountered in interpreting the configurations.

In the Leaf Rapids configuration, the communities of The Pas, Brandon, and Winnipeg form a distinct cluster, while Churchill and Lynn Lake are both located at the left extremity. However, Thompson, Portage, and Leaf Rapids are each located in isolated positions. The three communities grouped together are similar in that they are relatively old compared with the other places. They also have more stable populations comprised of demographically heterogeneous mixes of people. Given the high proportion of Leaf Rapids residents that have residential experience in other Manitoba communities, it can be surmised that the three towns represent ones with which they are familiar, and possibly where friends and relatives reside. The exclusion of Portage la Prairie from this group is interesting. The only apparent explanation for the isolation of Portage la Prairie in the configuration may be related to the lack of imageability of the community. This may be due to the fact that Portage la Prairie is by-passed by most people who travel along the Trans-Canada Highway. Although isolated in the configuration, Thompson is most closely aligned to Lynn

Lake. This perhaps reflects an association on the basis of functional similarity as mining communities. However, Leaf Rapids residents do not include their own community within the same cognitive space. Leaf Rapids is, in fact, located in closer proximity to The Pas, Brandon, and Winnipeg. This may be a reflection of the degree of familiarity or social attachment previously mentioned. This seems consistent with the findings of Brown et al. (1977) who suggest an association between familiarity and the attractiveness of a place as a migration destination.

Although interpretation of the configuration is not formally attempted on a two-dimensional basis, a possible dimensional distinction exists, separating The Pas, Brandon, Winnipeg and Leaf Rapids at one extreme from the other four communities. This may reflect concern for a "family environment". Identification of this dimension is suggested with reference to the personal constructs elicited during the preliminary field survey. Constructs associated with the communities of The Pas, Brandon, Winnipeg, and Leaf Rapids relate to housing and family-related attributes (e.g. education, recreation, safety, stability, and closeness to relatives). It would thus appear that residents differentiate among the communities on the basis of the suitability of their environments for raising a family. This interpretation is supported on the basis of existing research which suggests that stage in the family life-cycle

is an important variable in residential evaluation (Troy, 1973; Hourihan, 1979; Preston and Taylor, 1981a).

The configuration of communities for the Thompson subsample reflects some similar features to that of the Leaf Rapids residents. For instance, Portage la Prairie is again located far from other communities, while Lynn Lake and Churchill are close together. Thompson itself is placed fairly close to Winnipeg. This may reflect Thompson residents' greater familiarity with Winnipeg compared with the other communities. Although Leaf Rapids, for example, is geographically nearer to Thompson than Winnipeg, few Thompson residents have actually visited that community. Therefore, one interpretation of the clustering in the configuration could be on the basis of familiarity. Familiarity with places has been shown to have significant influence on preference and decision making in the context of migration (White, 1977; Gustavus and Brown, 1977).

For both configurations, interpretation of possible dimensions is difficult and speculative. One explanation for this may relate to the heterogeneous nature of the respondents who differ considerably in terms of age, sex, marital status, occupation, and length of residence. Such heterogeneity among the subjects hampers dimensional interpretation (Palmer, 1978). The Leaf Rapids configuration is perhaps the more readily interpretable of the two with at least one apparent dimension reflecting

family-oriented concerns. This may indeed underlie the fact that many of the Leaf Rapids respondents are married women with husbands employed in non-manual jobs. The Thompson sample, on the other hand, represents a much more diverse group of respondents and thus readily interpretable dimensions are not revealed.

Chapter VI

THE ANALYSIS: EXPERIENTIAL AND SOCIAL CHARACTERISTICS OF RESIDENTS

In this chapter the effects on the image of differing personal characteristics of the respondents are examined. The characteristics examined are past residential experience, length of residence in the community, sex differences, and marital status. The four hypotheses associated with these variables are each tested in two stages. The first stage concerning differences in the evaluative and designative aspects of the image is revealed by examining responses on the bipolar adjectival rating scales. The examination of these scales employs mean score responses and principal components analysis, and is based on the analysis of the entire sample[58]. The second stage focuses specifically on the analysis of respondents' rank-ordering of preferences. The study community is assessed with reference to seven other selected Manitoba towns. For the entire sample, descriptive statistics are presented of first and last choice preferences. However, the complete range of preferences is analysed using multidimensional scaling analysis with small subsamples of

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[58] The entire sample consists of 400 respondents: 297 Thompson residents, and 103 Leaf Rapids residents.

respondents[59].

6.1 TEST OF HYPOTHESIS CONCERNING RESIDENTIAL EXPERIENCE

Two separate aspects of residential experience are examined: (a) size of the community in which respondents were raised, and (b) location of respondents place of birth. Hypothesis 2 states:

> that the dimensions of residents' images of northern resource towns are influenced by the size and location of the communities in which they were born and raised.

For each of the variables, size and location, respondents are organised into two groups. For the size of community in which respondents were raised, a distinction is made between small towns with a population of less than 25,000, and larger communities. Although a somewhat arbitrary distinction, it is thought that this grouping does reflect differences among communities, particularly in a social context. In terms of location, a distinction is made between those born in Manitoba and those born elsewhere. In a general sense, this identifies respondents who have relatives in Manitoba, a greater knowledge of the province, and an overall affinity for the province. On the other hand, one might expect migrants to the province to have lower levels of information concerning the region and fewer

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[59] Due to the large computer memory space required to analyse responses from the entire sample, small subsamples of residents are randomly selected for this phase of the analysis.

social ties than those born in Manitoba.

6.1.1 Size of Community in which Respondents were Raised

6.1.1.1 Analysis of Bipolar Adjectival Rating Scales

A comparison of mean scores on the 46 rating scales (Figure 8, Table 4) reveals that differences in response do occur as a result of the size of community in which respondents were raised. Respondents raised in smaller towns judge their present community of residence to be relatively large. They also assign higher scores to shopping and outdoor recreational facilities, and consider their community to be less "rough" than do those raised in larger towns. Considerably more people from small towns indicate that they have relatives in the community, a probable reflection of social networks in small towns.

Separate principal components analyses of the rating scales were conducted for each of the two groups of respondents[60]. The analysis identifies three significant components for residents who were raised in rural or small town environments (Table 5). These components explain 28.1 percent of the total variance. The first component, explaining 15.2 percent of the variance, is defined by several scales with strong loadings. Scales with the strongest loadings relate to the social environment, including: exciting, lots to do, cheerful/depressing, and

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[60] Complete factor loadings for the significant components are presented in Appendix D.

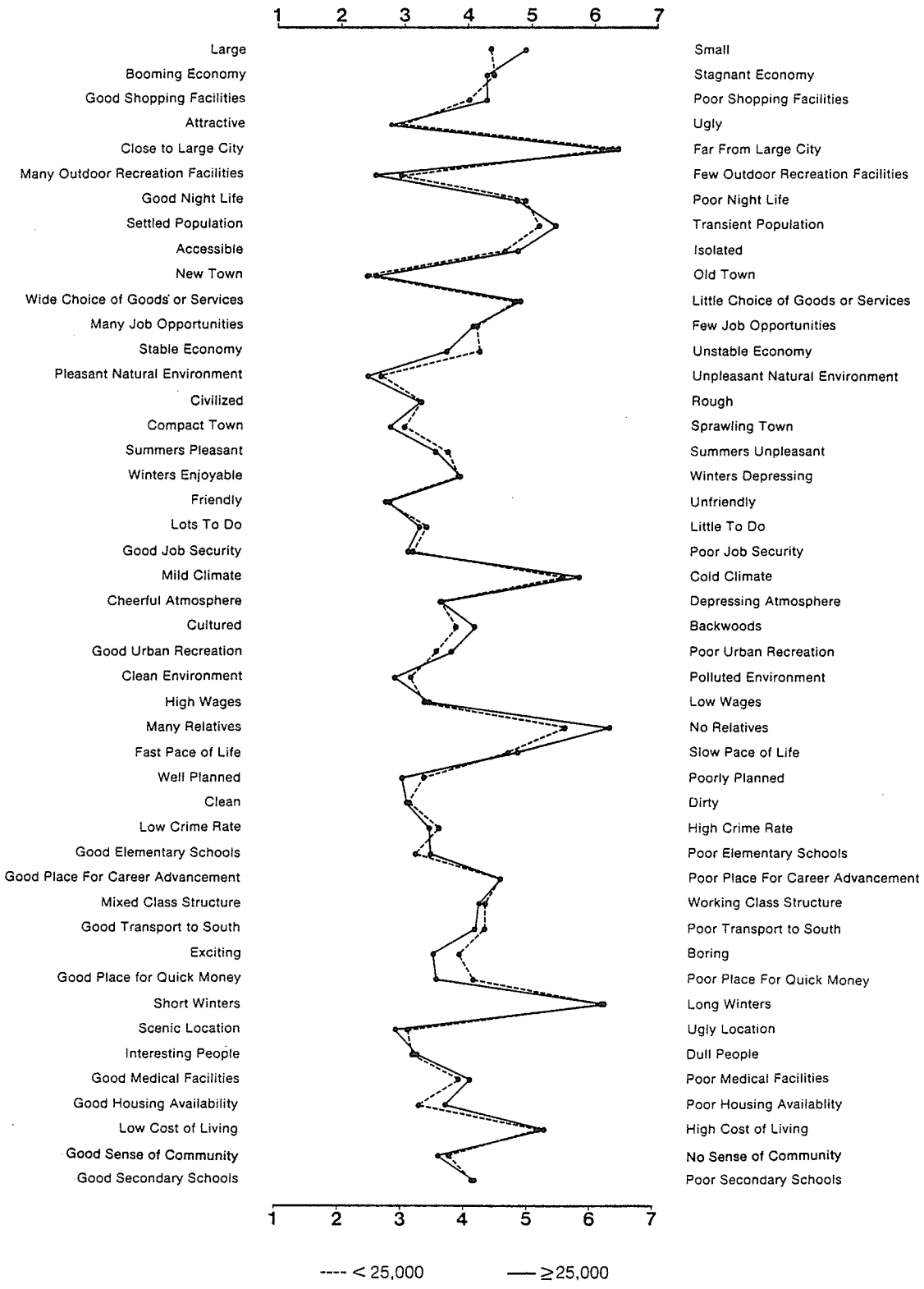


Figure 8. Size of Community in which Raised: Mean Responses to the Rating Scales

Table 4. Size of Community in which raised: Responses to Rating Scales

No.	Scale	< 25,000 (n=283) $\bar{X}$	Sd	> 25,000 (n=117) $\bar{X}$	Sd
1.	Large*Small	4.36	1.24	4.90	1.31
2.	Booming*Stagnant Economy	4.43	1.31	4.30	1.30
3.	Good*Poor Shopping Facilities	4.01	1.60	4.30	1.60
4.	Attractive*Ugly	2.97	1.33	2.79	1.37
5.	Close*Far from Large City	6.29	1.32	6.39	1.22
6.	Many*Few Outdoor Recreation Facilities	2.96	1.80	2.59	1.57
7.	Good*Poor Night Life	4.91	1.67	4.80	1.50
8.	Settled*Transient Population	5.15	1.64	5.39	1.43
9.	Accessible*Isolated	4.61	1.87	4.80	1.73
10.	New*Old Town	2.43	1.29	2.54	1.41
11.	Wide*Little Choice of Goods or Services	4.67	1.62	4.85	1.59
12.	Many*Few Job Opportunities	4.18	1.67	4.09	1.63
13.	Stable*Unstable Economy	4.21	1.59	4.18	1.53
14.	Pleasant*Unpleasant Natural Environment	2.69	1.46	2.45	1.47
15.	Civilised*Rough	3.29	1.47	3.27	1.49
16.	Compact*Sprawling Town	3.05	1.69	2.79	1.57
17.	Summers Pleasant*Unpleasant	3.70	1.60	3.53	1.64
18.	Winters Enjoyable *Depressing	3.87	1.77	3.92	1.75
19.	Friendly*Unfriendly	2.71	1.36	2.76	1.46
20.	Lots*Little To Do	3.39	1.75	3.27	1.62
21.	Good*Poor Job Security	3.18	1.63	3.08	1.47
22.	Mild*Cold Climate	5.55	1.35	5.79	1.21
23.	Cheerful*Depressing Atmosphere	3.64	1.38	3.60	1.58
24.	Cultured*Backwoods	3.86	1.41	4.15	1.47
25.	Good*Poor Urban Recreation	3.54	1.67	3.77	1.75
26.	Clean*Polluted Environment	3.15	1.69	2.88	1.62
27.	High*Low Wages	3.36	1.41	3.44	1.37
28.	Many*No Relatives	5.59	1.96	6.33	1.39
29.	Fast*Slow Pace of Life	4.68	1.40	4.84	1.42
30.	Well*Poorly Planned	3.35	1.67	3.00	1.55
31.	Clean*Dirty	3.13	1.47	3.07	1.53
32.	Low*High Crime Rate	3.62	1.50	3.45	1.45
33.	Good*Poor Elementary Schools	3.23	1.78	3.46	1.71
34.	Good*Poor Place for Career Advancement	4.58	1.77	4.57	1.77
35.	Mixed*Working Class Structure	4.34	1.74	4.24	1.58
36.	Good*Poor Transport to South	4.34	1.93	4.18	1.84
37.	Exciting*Boring	3.95	1.35	4.01	1.45
38.	Good*Poor Place for Quick Money	4.16	1.81	4.05	1.73
39.	Short*Long Winters	6.17	1.27	6.21	1.19
40.	Scenic*Ugly Location	3.12	1.61	2.91	1.81
41.	Interesting*Dull People	3.20	1.38	3.26	1.41
42.	Good*Poor Medical Facilities	3.94	1.90	4.11	1.84
43.	Good*Poor Housing Availability	3.29	1.86	3.72	1.91
44.	Low*High Cost of Living	5.21	1.43	5.28	1.44
45.	Good*No Sense of Community	3.77	1.49	3.59	1.41
46.	Good*Poor Secondary Schools	4.14	1.77	4.16	1.70

Table 5. Summary of varimax-rotated component loadings: Respondents raised in communities of under 25,000 population

	Component	Loading	Total variance explained
1.	Social Activity		15.2%
	37. exciting-boring	0.69	
	20. lots-little to do	0.65	
	23. cheerful-depressing atmosphere	0.63	
	25. good-poor urban recreation	0.63	
	11. wide-little choice of goods or services	0.55	
	7. good-poor nightlife	0.54	
	45. good-no sense of community	0.54	
	1. large-small	0.51	
2.	Northern Environment		7.7%
	14. pleasant-unpleasant natural environment	-0.51	
	39. short-long winters	0.49	
	40. scenic-ugly location	-0.45	
3.	Northern Economy		5.2%
	13. stable-unstable economy	0.51	
	2. booming-stagnant economy	0.50	

urban recreational facilities. Other scales loading strongly indicate the sense of community, nightlife, and community size. This component is therefore labelled "Social Activity". The second component is labelled "Northern Environment" and explains 7.7 percent of the total variance. On this component, the length of winters scale has a positive loading (0.48) contrasting with the negative loadings of the scales concerning "pleasant/unpleasant natural environment" (-0.51) and "scenic/ugly" location (-0.45). The implication would seem to be that despite long winters, the quality of the natural environment and scenic quality are favorably assessed. The third component, explaining 5.2 percent of the total variance, is labelled "Northern Economy" and has two scales with strong loadings: boom/bust nature of mining communities and the general level of economic stability.

The first component extracted for residents raised in communities of over 25,000 population has a broadly similar pattern of loadings to the principal component obtained for respondents raised in smaller towns (Table 6). It is thus also labelled "Social Activity" and explains 16.6 percent of the total variance. However, whereas respondents from small towns associate the scales concerning friendliness, lots to do and excitement with urban recreation, respondents from larger communities associate them with outdoor recreational opportunities. The second component is labelled "Urban

Table 6. Summary of varimax-rotated component loadings: Respondents raised in communities of over 25,000 population

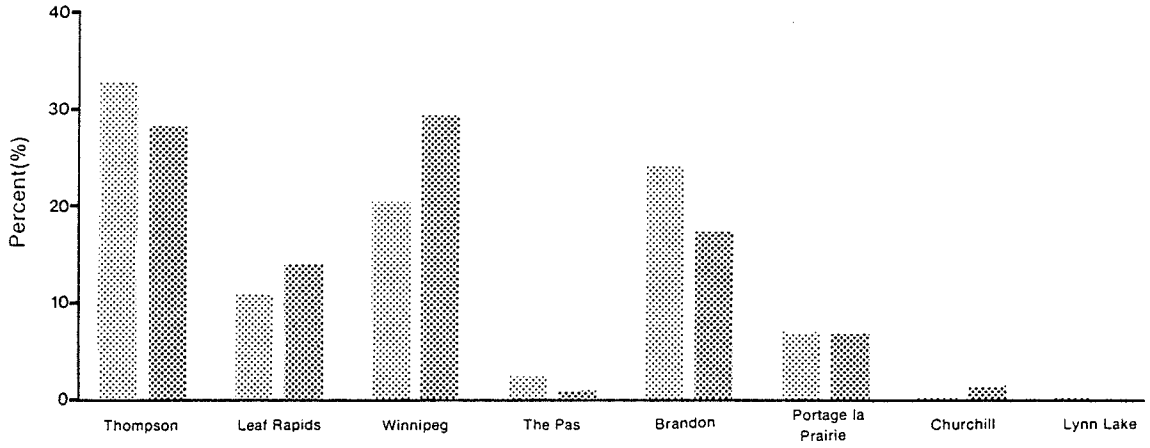
Component	Loading	Total variance explained
1. Social Activity		16.6%
20. lots-little to do	0.81	
37. exciting-boring	0.75	
41. interesting-dull people	0.63	
6. many-few outdoor recreation facilities	0.62	
19. friendly-unfriendly	0.56	
40. scenic-ugly location	0.56	
2. Urban Character		8.2%
24. cultured-backwoods	0.75	
31. clean-dirty	0.74	
16. compact-sprawling town	0.54	
3. Northern Character		6.0%
44. low-high cost of living	0.70	
18. winters enjoyable-depressing	0.69	
39. short-long winters	0.61	

Character" (8.2 percent of total variance) and has scales with high loadings associated with compactness, cleanliness, and degree of culture. The third component (6.0 percent of total variance) is labelled "Northern Character" and is defined by such scales as enjoyment of winter, length of winter, and cost of living.

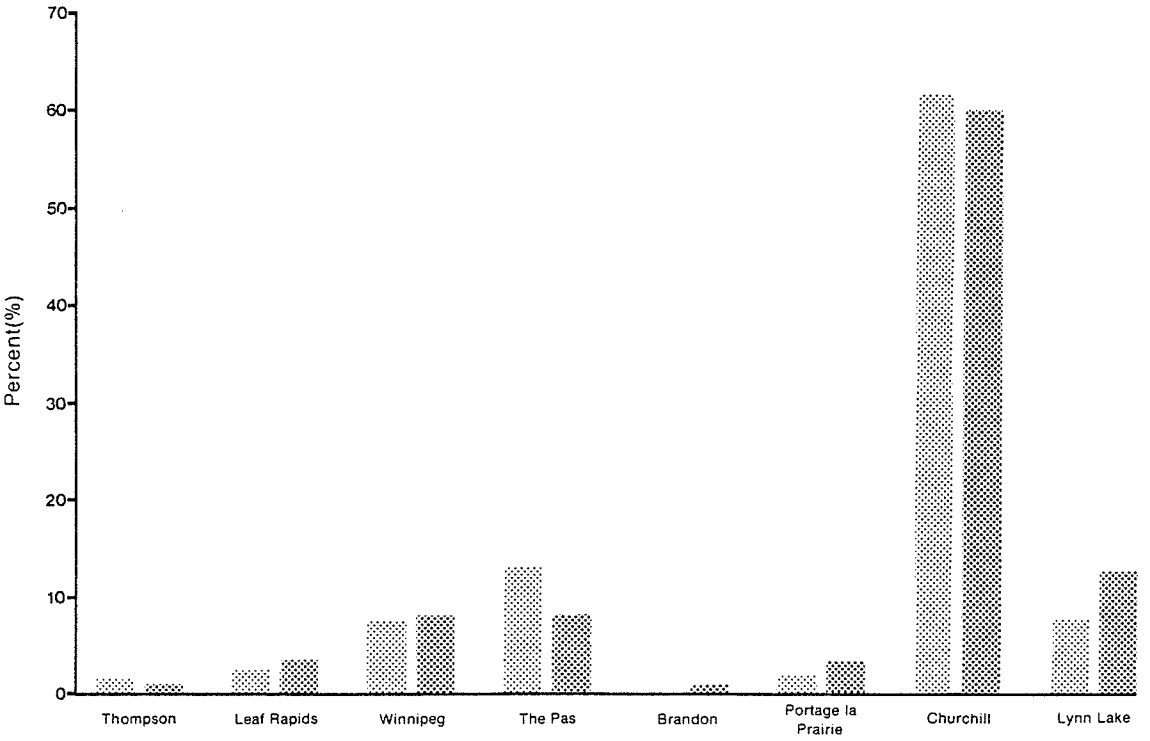
On the basis of these findings, there do not appear to be significant differences in the image related to the size of the community in which the respondent was raised. Nevertheless, respondents do appear to emphasise aspects of the community which differ most from their early environmental experience. Thus, respondents from small towns emphasise urban facilities, while those from larger communities stress the natural environment. Although these inferences may appear somewhat self-evident, they are nevertheless, consistent with adaptation-level theory (Helson, 1964) and previous empirical findings which relate this theory to the size of migrants most recent prior community of residence (Wohlwill and Kohn, 1973).

6.1.1.2 Analysis of Preference Rankings

The first and last preferences of the two groups of respondents are shown in Figure 9. For residents raised in communities of over 25,000 population, the largest proportion (30 percent) express a preference for Winnipeg. An almost equal proportion rank Thompson first and 17.6



a) First Preference



b) Last Preference

Figure 9. Size of Community in which Raised: First and Last Preferences for Selected Manitoba Communities

percent select Brandon as first choice. For residents raised in smaller communities, the same three communities are most frequently ranked first, but in a different order. Specifically, Thompson is most frequently ranked first (33 percent) followed by Brandon (24 percent). For both groups, Churchill is most frequently assigned a last place ranking (i.e. by about 60 percent of the respondents). Differences between the groups are, however, evident in terms of the community which is ranked as final choice by the second highest proportion of respondents. Of those raised in small communities, 13.5 percent rank The Pas as last choice, while 13.0 percent from the larger towns assign a similar ranking to Lynn Lake.

The two-dimensional MDS configurations based on the analysis of preferences are shown in Figure 10[61]. Clusters are evident in the configuraticns of both groups of respondents. Respondents raised in small communities (Figure 10a) locate all the northern resource communities in the same region of the cognitive space which can be further subdivided into two smaller clusters. Thus, Thompson and Leaf Rapids are located close together, with Lynn Lake and Churchill in a second group. A separate cluster includes Winnipeg, Brandon, and The Pas. Portage la Prairie is peripheral to both of these clusters, a characteristic that

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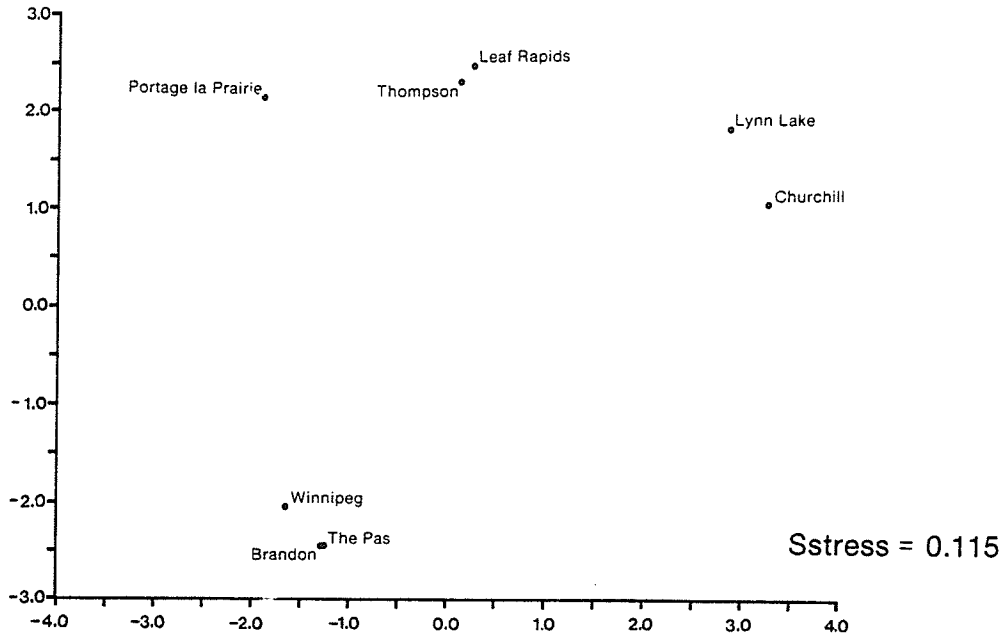
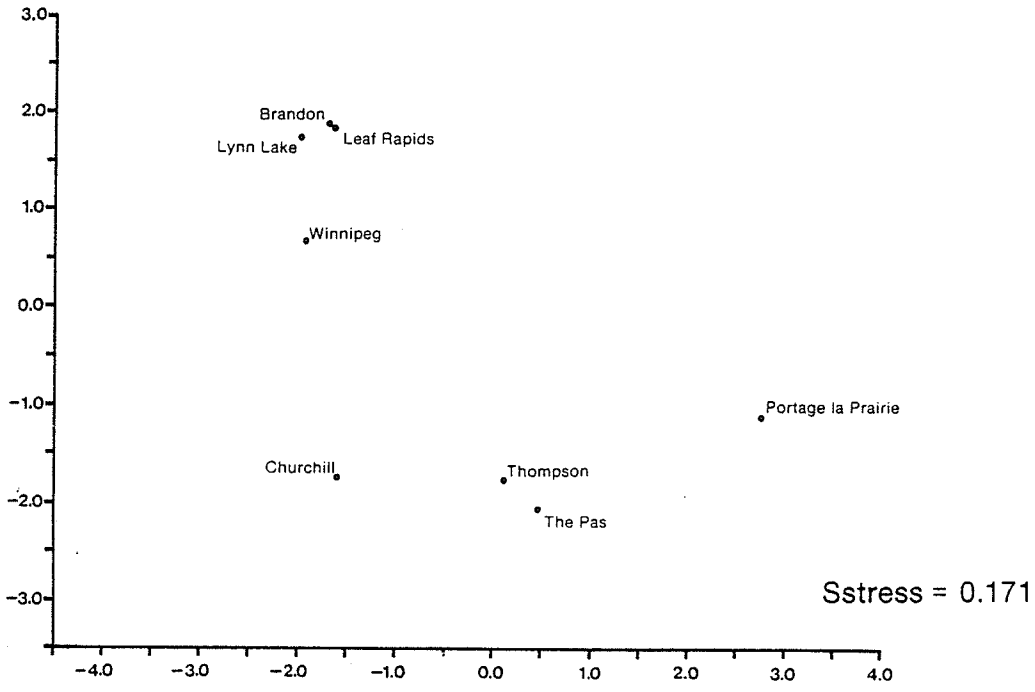
[61] The configurations are based on responses from the following subsamples: raised in community of less than 25,000 n=62, raised in community of over 25,000 n=39.



a) Under 25,000



b) 25,000 and Over

Figure 10. Size of Community in which Raised: Two-Dimensional Preference Configurations

has been noted previously in other configurations (see Section 5.2.3.2).

Residents raised in larger communities (Figure 10b) locate Brandon, Lynn Lake, and Leaf Rapids in a similar part of the cognitive space, with Winnipeg some distance away. Churchill, Thompson, and The Pas form a separate loose cluster in the space. This configuration is not readily interpretable. However, due to the emphasis that this subgroup places on levels of social activity and excitement in the components analysis (Section 6.2.1), the configuration may represent a distinction on this basis.

6.1.2 Location of Place of Birth

6.1.2.1 Analysis of Bipolar Adjectival Rating Scales

Differences in mean response to the 46 bipolar rating scales between those born in Manitoba and those born outside the province are shown in Figure 11 and Table 7. Manitoba-born respondents generally rate their present community of residence more positively on most scales than do those born outside the province. In particular, scales associated with the winter climate (mildness and enjoyment of winter), shopping facilities and choice of goods, accessibility, presence of relatives, elementary school facilities and scenic quality all registered more positive evaluations.

The responses of both groups of respondents to the rating scales are each analysed separately using principal

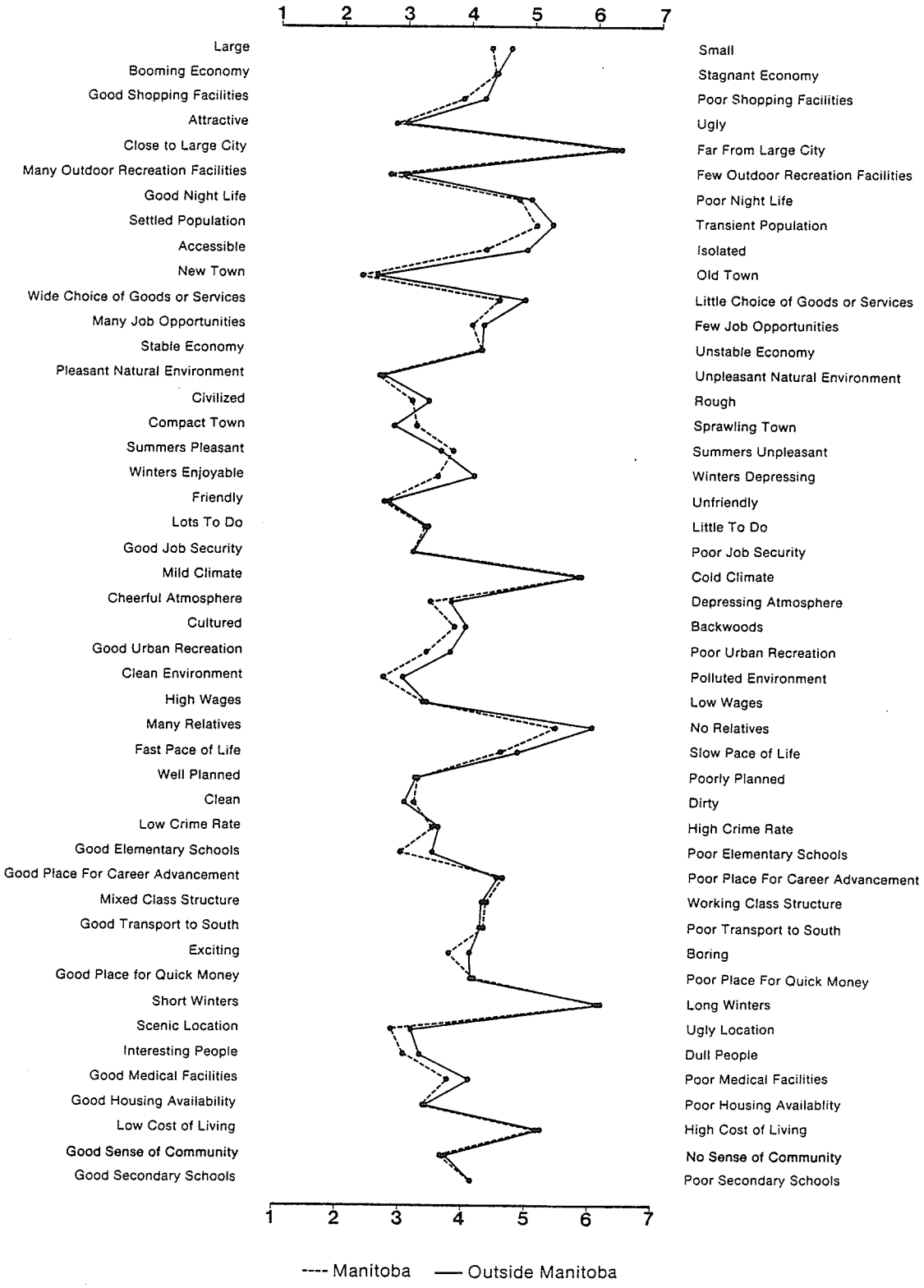


Figure 11. Birthplace: Mean Responses to the Rating Scales

Table 7. Birthplace: Responses to Rating Scales

No.	Scale	Manitoba born (n=163) $\bar{X}$	Sd	Non-Manitoba born (n=237) $\bar{X}$	Sd
1.	Large-Small	4.32	1.21	4.64	1.31
2.	Booming-Stagnant Economy	4.38	1.38	4.40	1.27
3.	Good-Poor Shopping Facilities	3.88	1.59	4.23	1.61
4.	Attractive-Ugly	2.83	1.34	2.98	1.34
5.	Close-Far from Large City	6.26	1.27	6.36	1.30
6.	Many-Few Outdoor Recreation Facilities	2.74	1.71	2.94	1.77
7.	Good-Poor Night Life	4.77	1.58	4.96	1.65
8.	Settled-Transient Population	5.04	1.60	5.33	1.57
9.	Accessible-Isolated	4.29	1.80	4.90	1.82
10.	New-Old Town	2.30	1.26	2.56	1.36
11.	Wide-Little Choice of Goods or Services	4.45	1.54	4.89	1.63
12.	Many-Few Job Opportunities	4.05	1.67	4.22	1.64
13.	Stable-Unstable Economy	4.19	1.47	4.21	1.64
14.	Pleasant-Unpleasant Natural Environment	2.57	1.43	2.66	1.49
15.	Civilised-Rough	3.13	1.43	3.39	1.49
16.	Compact-Sprawling Town	3.19	1.73	2.83	1.60
17.	Summers Pleasant-Unpleasant	3.77	1.59	3.59	1.62
18.	Winters Enjoyable -Depressing	3.52	1.62	4.13	1.82
19.	Friendly-Unfriendly	2.68	1.40	2.76	1.38
20.	Lots-Little To Do	3.30	1.68	3.39	1.74
21.	Good-Poor Job Security	3.16	1.50	3.15	1.65
22.	Mild-Cold Climate	5.32	1.36	5.80	1.25
23.	Cheerful-Depressing Atmosphere	3.42	1.43	3.75	1.43
24.	Cultured-Backwoods	3.83	1.39	4.01	1.45
25.	Good-Poor Urban Recreation	3.38	1.62	3.75	1.72
26.	Clean-Polluted Environment	3.18	1.67	3.00	1.67
27.	High-Low Wages	3.35	1.45	3.41	1.36
28.	Many-No Relatives	5.42	2.02	6.03	1.69
29.	Fast-Slow Pace of Life	4.57	1.33	4.83	1.44
30.	Well-Poorly Planned	3.28	1.63	3.24	1.66
31.	Clean-Dirty	3.21	1.49	3.05	1.48
32.	Low-High Crime Rate	3.49	1.43	3.63	1.53
33.	Good-Poor Elementary Schools	2.97	1.64	3.50	1.81
34.	Good-Poor Place for Career Advancement	4.62	1.82	4.55	1.73
35.	Mixed-Working Class Structure	4.34	1.69	4.29	1.70
36.	Good-Poor Transport to South	4.34	1.90	4.27	1.93
37.	Exciting-Boring	3.77	1.32	4.10	1.40
38.	Good-Poor Place for Quick Money	4.16	1.73	4.11	1.82
39.	Short-Long Winters	6.13	1.07	6.22	1.36
40.	Scenic-Ugly Location	2.89	1.47	3.17	1.78
41.	Interesting-Dull People	3.07	1.39	3.31	1.38
42.	Good-Poor Medical Facilities	3.77	1.80	4.14	1.93
43.	Good-Poor Housing Availability	3.40	1.93	3.41	1.85
44.	Low-High Cost of Living	5.18	1.37	5.26	1.47
45.	Good-No Sense of Community	3.67	1.55	3.75	1.42
46.	Good-Poor Secondary Schools	4.14	1.79	4.15	1.72

components analysis[62]. For both those born in Manitoba and outside the province three components are extracted, each explaining over 5 percent of the total variance (Tables 8 and 9). The principal component for Manitoba-born residents, explaining 15.7 percent of the total variance, largely expresses the nature of the people in the communities. The scales which load strongly onto this component relate to whether the residents of the home community are interesting and friendly, and also to the sense of community and cheerfulness of the town. The second component, which explains 8.3 percent of the total variance, focuses on the size of the community and related urban amenities. Scales with the highest loadings are size (0.72), shopping facilities (0.71), housing (0.70), and medical facilities (0.63). The third component is labelled "Physical Environment". The scales which load strongly on this component are natural environment, attractiveness, scenic quality, and urban planning.

For non-Manitoba born respondents, the principal component relates to the character of the urban environment and accounts for 14.9 percent of the total variance (Table 9). As in the case of the second component identified by Manitoba- born respondents, community size emerges as a key variable. Size is related to housing availability, nightlife, choice of goods, pace of life, and sense of

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[62] Complete listings of the factor loadings on the significant components are presented in Appendix D.

Table 8. Summary of varimax-rotated component loadings: Respondents born in Manitoba

Component	Loading	Total variance explained
1. People		15.7%
41. dull-interesting people	0.83	
45. good-no sense community	0.65	
19. friendly-unfriendly	0.61	
23. cheerful-depressing atmosphere	0.53	
2. Community Size		8.3%
1. large-small	0.73	
3. good-poor shopping facilities	0.71	
42. good-poor medical facilities	0.71	
43. good-poor housing availability	0.63	
3. Physical Environment		5.2%
14. pleasant-unpleasant natural environment	0.72	
40. scenic-ugly location	0.68	
30. well-poorly planned	0.61	
4. attractive-ugly	0.52	

Table 9. Summary of varimax-rotated component loadings: Respondents born outside Manitoba

	Component	Loading	Total variance explained
1.	Urban Environment		14.9%
1.	large-small	0.63	
29.	fast-slow pace of life	0.58	
43.	good-poor housing availability	0.58	
11.	wide-little choice of goods or services	0.57	
7.	good-poor nightlife	0.55	
45.	good-no sense of community	0.55	
9.	accessible-isolated	0.52	
2.	Physical/Social Environment		8.1%
4.	attractive-ugly	0.74	
14.	pleasant-unpleasant natural environment	0.68	
15.	civilised-rough	0.62	
19.	friendly-unfriendly	0.61	
30.	well-poorly planned	0.55	
41.	interesting-dull people	0.52	
3.	Northern Character		5.6%
18.	winters enjoyable-depressing	0.81	
37.	exciting-boring	0.60	
23.	cheerful-depressing atmosphere	0.54	

community. However, the strong loading of accessibility suggests that these community amenities are not merely related to size characteristics, but also to the northern location. The second component (8.1 percent of the total variance) expresses a composite of the physical and social environment. Physical features include attractiveness, pleasantness of the natural environment, and urban planning, while social variables relate to friendliness, and interesting/dull people. The third component, which explains 5.6 percent of the total variance, appears to be associated with the northern character of the community. Three scales load strongly on this component: enjoyment of winters, degree of excitement, and cheerful/depressing atmosphere of the community.

The major components extracted for the two groups of respondents generally exhibit a considerable degree of consensus, although there are differences. In particular, Manitoba-born residents generally place greater emphasis on the people as opposed to the urban facilties. Some parallel might be drawn between this finding and the results of analysis of the effects of length of residence on the image of northern communities. Longer-term residents also place greater emphasis on the social environment. This would seem to imply that familiarity with the physical environment reduces its significance in terms of place evaluation. Although the northern Manitoba environment does differ in

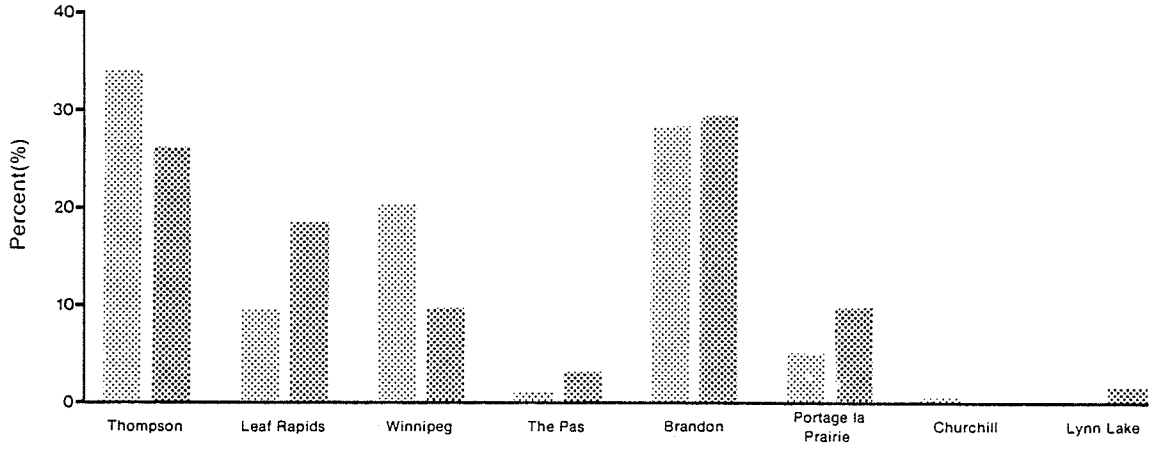
some respects from that of the southern part of the province where the majority of Manitobans are born, it is nevertheless more familiar to them than to non-Manitobans. This is further emphasised by the fact that, although both groups identify aspects of the natural environment as important components of the image, non-Manitobans place greater emphasis on the northern characteristics.

6.1.2.2 Analysis of Preference Rankings

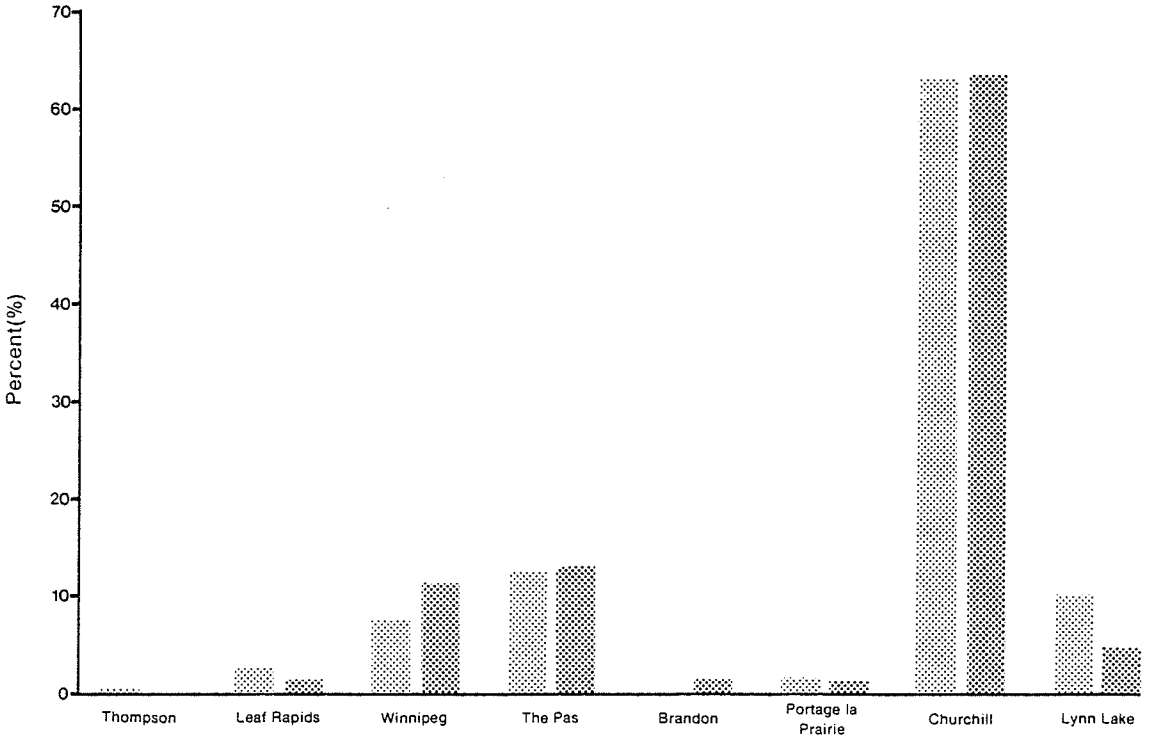
Differences in the first and last choice preferences of rankings of Manitoba communities are shown in Figure 12. Those born in Manitoba most frequently rank Thompson first (34 percent), followed by Brandon (28 percent) and Winnipeg (20 percent). This would seem to be a reflection of familiarity and the presence of friends or relatives. For the non-Manitoba born respondents, Brandon is the most frequently first-ranked community (29 percent), followed by Thompson (26 percent) and Leaf Rapids (18 percent). It is interesting to note that Winnipeg is ranked first by only 10 percent of non-Manitobans. Churchill is clearly the least preferred community for both groups (63 percent in both cases) followed by The Pas.

Figure 13 shows the two-dimensional configurations obtained from MDS analysis of the two sets of preference rankings[63]. Manitoba-born respondents (Figure 13a) locate

[63] The configurations are based on responses from the following subsamples: Manitoba-born n=44, born outside Manitoba n=47.



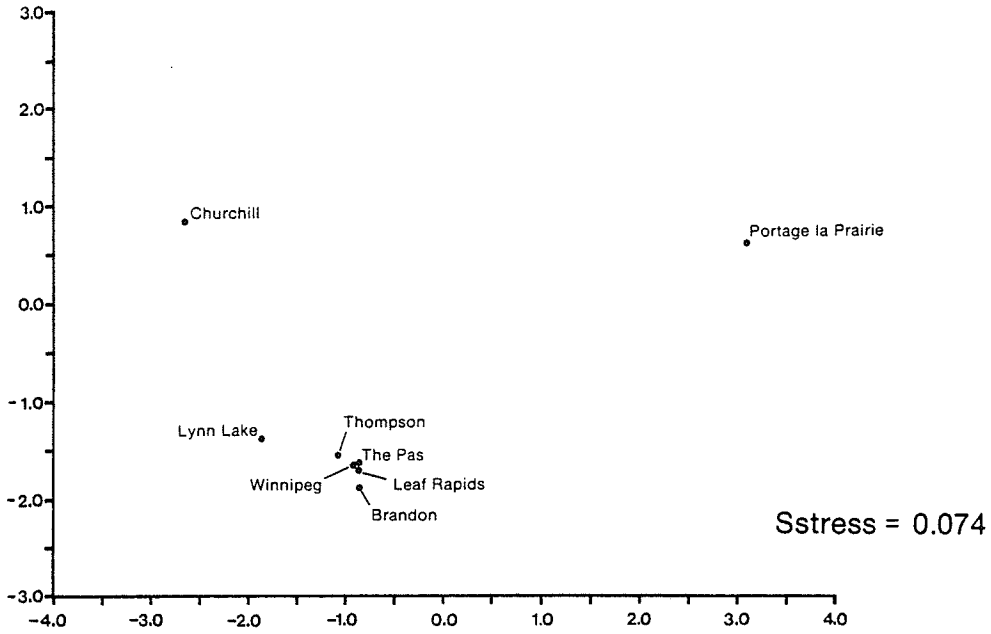
a) First Preference



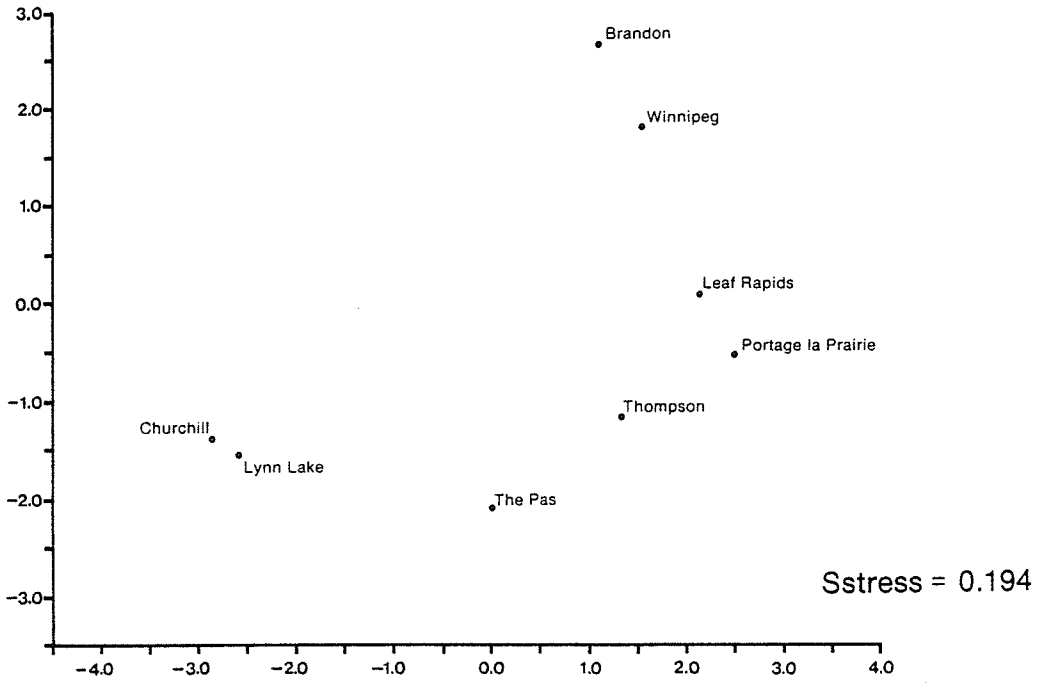
b) Last Preference

-Manitoba -Outside Manitoba

Figure 12. Birthplace: First and Last Preferences for Selected Manitoba Communities



a) Manitoba



b) Outside Manitoba

Figure 13. Birthplace: Two-Dimensional Preference Configurations

Thompson, Winnipeg, The Pas, Leaf Rapids, and Brandon in a similar region of the cognitive space. Lynn Lake is located a short distance from this group, but Churchill and Portage la Prairie are well separated from the cluster. This may reflect the degrees of familiarity with the various communities, perhaps relating to places associated with friends or relatives. The configuration for non-Manitobans (Figure 13b) is much more diverse and no clear interpretation is evident, although the mutual proximity of Lynn Lake and Churchill may indicate a judgment on the basis of their poor accessibility to the other larger communities.

6.1.3 Summary of Findings Concerning Residential Experience

The hypothesis that the size and location of the places in which a resident is born and raised will influence the image of the present community of residence is generally supported. However, the specific effects of these two variables are not clearly evident. It would appear that the distinction on the basis of the location rather than the size of the community is more significant in terms of distinguishing among the responses of northern residents. It is possible, however, that other aspects of past residential experience, particularly the migration behavior of residents during adulthood, could be of greater significance in providing the bases for judgments.

6.2 TESTS OF HYPOTHESES CONCERNING LENGTH OF RESIDENCE

Two categories of respondents are identified to test the hypotheses concerning the effects of length of residence on the community image : those living in Thompson and Leaf Rapids less than five years, and those with five years or more residential experience. Of the entire sample of 400, 36 percent (142) were residents of less than five years duration and 64 percent (258) had lived in the communities for five years or more. The hypotheses tested are:

Hypothesis 3

> that short-term residents' images of northern resource communities are related to personal aspirations rather than community related factors;

Hypothesis 4

> that longer-term residents' images of northern resource communities are predominantly structured in terms of community related factors.

6.2.1 Analysis of the Bipolar Adjectival Rating Scales

The mean scores on the 46 bipolar rating scales (Figure 14 and Table 10) reveal relatively small magnitudes of difference in community image between short-term and long-term residents. However, short-term residents express slightly more negative evaluations of the degree of transience, "roughness" of the community, enjoyment of winters, and the medical facilities. However, they evaluate the communities as better places for earning "quick money" than do longer-term residents. These aspects of life seem

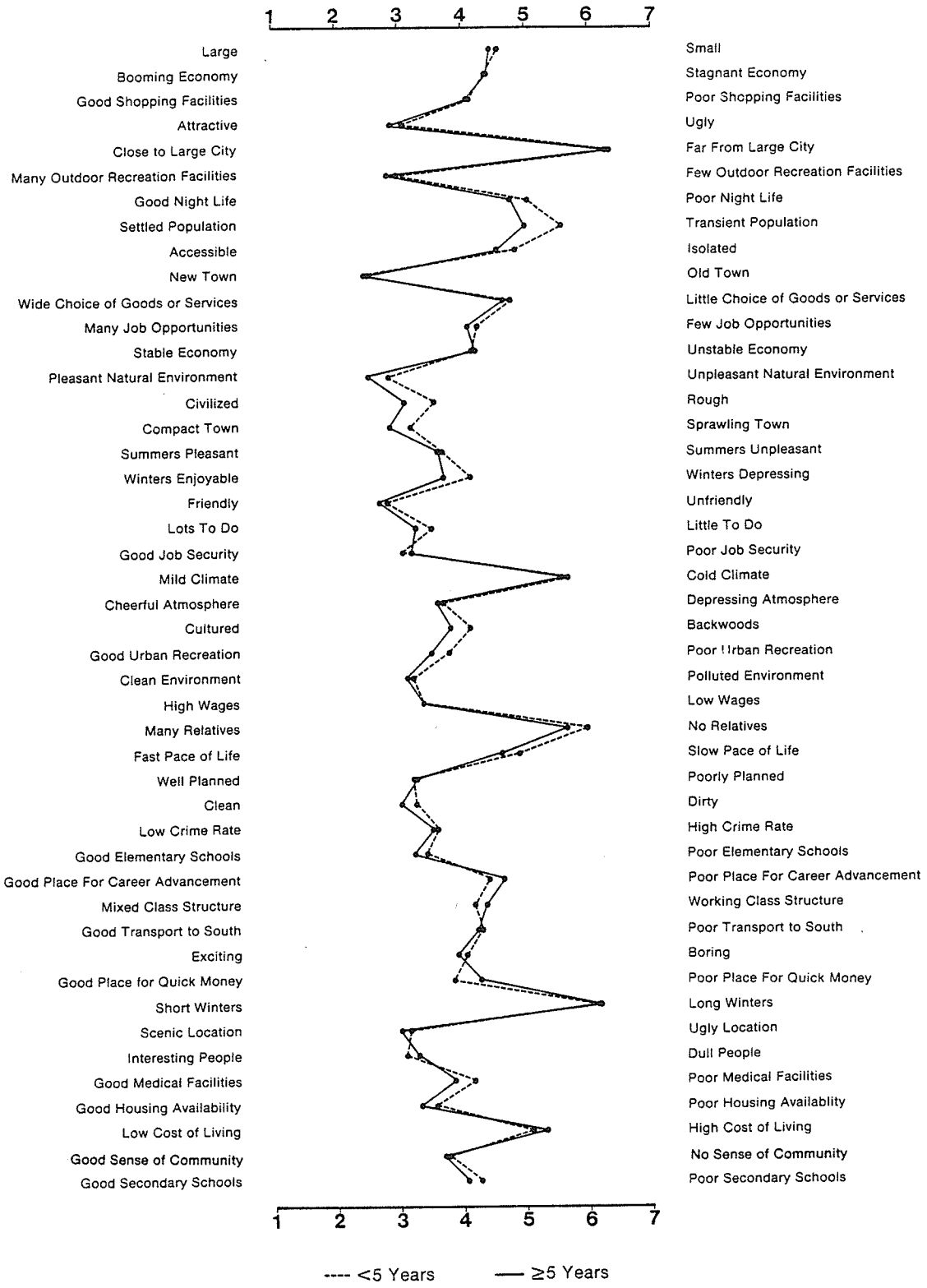


Figure 14. Length of Residence: Mean Responses to the Rating Scales

Table 10: Length of Residence: Responses to Rating Scales

No.	Scale	Less than 5 years (n=144) $\bar{X}$	Sd	Five years or more (n=256) $\bar{X}$	Sd
1.	Large-Small	4.59	1.38	4.46	1.22
2.	Booming-Stagnant Economy	4.38	1.39	4.41	1.26
3.	Good-Poor Shopping Facilities	4.13	1.63	4.07	1.60
4.	Attractive-Ugly	3.05	1.44	2.85	1.28
5.	Close-Far from Large City	6.37	1.18	6.29	1.35
6.	Many-Few Outdoor Recreation Facilities	2.98	1.80	2.79	1.72
7.	Good-Poor Night Life	5.05	1.55	4.79	1.66
8.	Settled-Transient Population	5.58	1.36	5.00	1.66
9.	Accessible-Isolated	4.84	1.88	4.56	1.80
10.	New-Old Town	2.45	1.32	2.47	1.33
11.	Wide-Little Choice of Goods or Services	4.81	1.65	4.66	1.59
12.	Many-Few Job Opportunities	4.25	1.69	4.10	1.64
13.	Stable-Unstable Economy	4.19	1.67	4.21	1.52
14.	Pleasant-Unpleasant Natural Environment	2.82	1.72	2.51	1.29
15.	Civilised-Rough	3.58	1.51	3.12	1.43
16.	Compact-Sprawling Town	3.19	1.70	2.85	1.62
17.	Summers Pleasant-Unpleasant	3.69	1.77	3.64	1.52
18.	Winters Enjoyable -Depressing	4.15	1.70	3.74	1.79
19.	Friendly-Unfriendly	2.80	1.47	2.67	1.34
20.	Lots-Little To Do	3.49	1.78	3.28	1.68
21.	Good-Poor Job Security	3.07	1.61	3.21	1.58
22.	Mild-Cold Climate	5.63	1.31	5.57	1.32
23.	Cheerful-Depressing Atmosphere	3.68	1.56	3.60	1.36
24.	Cultured-Backwoods	4.14	1.46	3.82	1.40
25.	Good-Poor Urban Recreation	3.73	1.64	3.50	1.71
26.	Clean-Polluted Environment	2.99	1.57	3.12	1.73
27.	High-Low Wages	3.39	1.54	3.38	1.31
28.	Many-No Relatives	5.99	1.68	5.68	1.93
29.	Fast-Slow Pace of Life	4.89	1.38	4.63	1.41
30.	Well-Poorly Planned	3.23	1.67	3.27	1.64
31.	Clean-Dirty	3.27	1.56	3.03	1.44
32.	Low-High Crime Rate	3.63	1.56	3.54	1.44
33.	Good-Poor Elementary Schools	3.42	1.74	3.22	1.77
34.	Good-Poor Place for Career Advancement	4.42	1.80	4.66	1.74
35.	Mixed-Working Class Structure	4.20	1.79	4.38	1.65
36.	Good-Poor Transport to South	4.30	1.95	4.29	1.91
37.	Exciting-Boring	4.06	1.45	3.91	1.33
38.	Good-Poor Place for Quick Money	3.86	1.83	4.28	1.74
39.	Short-Long Winters	6.17	1.24	6.19	1.26
40.	Scenic-Ugly Location	3.17	1.82	3.00	1.58
41.	Interesting-Dull People	3.10	1.30	3.28	1.44
42.	Good-Poor Medical Facilities	4.17	1.91	3.88	1.86
43.	Good-Poor Housing Availability	3.58	1.89	3.31	1.87
44.	Low-High Cost of Living	5.06	1.45	5.32	1.42
45.	Good-No Sense of Community	3.77	1.47	3.69	1.47
46.	Good-Poor Secondary Schools	4.28	1.70	4.07	1.77

to be particularly related to the nature of life in northern resource communities. Although some of the short-term residents will have had prior experience of living in similar communities, for many it is a new experience. Aspects of community life that differ notably from their previous residential experience are therefore emphasised. Longer-term residents, on the other hand, appear to have adapted to those aspects of life peculiar to northern resource communities and thus do not specifically emphasise them. Presumably those that have been unable to adapt to a physical and social environment characterised by long winters, a transient population, restricted cultural opportunity and limited medical facilities will not have remained in the community over five years.

Principal components analysis of the 46 rating scales reveals the relationships between the variables for each of the two groups of respondents (Tables 11, and 12)[64]. For short-term residents, three components each account for over 5 percent of the total variance and together explain 32 percent of the total variance (Table 11). The first component explains 16.8 percent of the total variance. The scales which load most strongly on this dimension relate to urban amenities. The scale relating to community size has the strongest loading (0.77). This appears to be the key variable since the magnitudes of other variables are often

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[64] Complete listings of the factor loadings on the significant components are presented in Appendix D.

Table 11. Summary of varimax-rotated component loadings: Respondents of less than five years residence

Component	Loading	Total variance explained
1. Urban Amenities		16.8%
1. large-small	0.77	
3. good-poor shopping facilities	0.68	
11. wide-little choice of goods or services	0.66	
42. good-poor medical facilities	0.63	
29. fast-slow pace of life	0.61	
43. good-poor housing availability	0.59	
2. Physical Character		9.2%
31. clean-dirty	0.70	
15. civilised-rough	0.62	
4. attractive-ugly	0.61	
14. pleasant-unpleasant natural environment	0.50	
3. Activity Opportunity		6.1%
17. summers pleasant-unpleasant	0.70	
37. exciting-boring	0.64	
18. winters enjoyable-depressing	0.62	
23. cheerful-depressing	0.55	
40. scenic-ugly location	0.55	

dependent on community size (e.g. shopping facilities, choice of goods, medical facilities, and housing availability). A strong loading (0.61) on the scale relating to "pace of life" is an indicator of the activity level associated with the size variable.

The component explaining the second largest percentage of total variance (9.2 percent) for short-term residents appears to relate to the physical appearance of the communities. The scales with the highest loadings include attractiveness, pleasantness of the natural environment, and cleanliness. In addition, the high loading of the "rough/civilised" scale further suggests that this component may refer specifically to physical characteristics of northern resource towns. The third component (6.1 percent of total variance) focuses on the activity opportunities associated with the physical environment, including the enjoyment of summers (0.70) and winters (0.62), the degree of excitement (0.64), and cheerfulness (0.55). This component also concerns the evaluation of scenic quality (0.55). Scales loading on the component appear to be superordinate variables generally characterising the life-style opportunities and activities in the northern environment. In summary, it appears that short-term residents place greatest emphasis on the level of urban amenities, the physical environment, and the level of excitement and activity offered by the northern environment.

For residents who have lived in the study communities for five years or more, only two components explain over 5 percent of the total variance (Table 12). The first component (14.6 percent of the total variance) discloses the strongest loadings from scales associated with the social environment. This includes objective aspects such as urban recreational facilities (0.60) and nightlife (0.50), and subjective aspects such as cheerfulness (0.58), excitement (0.69), lots to do (0.63) and interesting people (0.62). Also loading strongly on this component is an assessment of shopping facilities (0.50). The second component explains 7.4 percent of the total variance and identifies the frontier character of the communities. Scales which load strongly on this component include assessments of the natural environment (0.50) and the scenic quality (0.48), in conjunction with such urban characteristics as the transience of the population (-0.47) and the age of the community (0.46).

The images exhibited by the two groups of respondents thus reveal significant differences. Those residents who have lived five years or more in the community appear to emphasise the more subjective aspects of the communities, placing greater emphasis on social attributes. Shorter term residents, on the other hand, attach greater significance to such functional attributes as urban amenities. Urban amenities have frequently been considered as major

Table 12. Summary of varimax-rotated component loadings: Respondents of five years or more residence

Component	Loading	Total variance explained
1. Social Environment		14.6%
37. exciting-boring	0.69	
41. interesting-dull people	0.62	
25. good-poor urban recreation	0.60	
23. cheerful-depressing atmosphere	0.58	
3. good-poor shopping facilities	0.50	
7. good-poor nightlife	0.50	
2. Frontier Character		7.4%
14. pleasant-unpleasant natural environment	0.50	
40. scenic-ugly location	0.48	
8. settled-transient population	-0.47	
10. new-old town	0.46	

components in place utility studies (e.g. Brown and Gustavus, 1977; Blackwood and Carpenter, 1978), and there seems little doubt that they play an important role when evaluating a community as a potential migration destination. It seem likely that short-term residents will have made their most comprehensive community evaluation prior to moving to the community when practical considerations such as housing, shopping and medical facilities are of importance. On the other hand, residents of five years or more will probably have re-evaluated their community and made a conscious decision to remain in the north. At this stage it would appear that the quality of life in the community is judged more in terms of the social environment, perhaps as a result of having already adapted to aspects of the physical environment.

Both short-term and longer-term residents recognise the unique character of the northern resource community in the context of the natural environment. However, the economic aspects of northern resource communities, which it was believed would be of significance in the images of short-term residents, are apparently not of importance. Although such economic factors as job opportunity and income are obviously important in the initial decision to move to the north (see Section 5.2.1), these aspects are of relatively little relevance in subsequent community evaluation. It would appear that, although physical

attributes of the community are initially of prime importance, with increased length of residence these aspects are replaced by an emphasis on the social environment. This transition may be due to selective out-migration of residents who are not satisfied with the the physical and social environment of northern resource towns, or to adaptation over time to the life-style in such communities.

There thus appears to be a three-stage cycle in the evaluation of place utility. The first stage is prior to migration to the community when the overriding concern is economic. The second stage occurs during the first years in the community when the urban amenities are considered to be of greatest importance. If a person is satisfied (or adapts) to the environment and decides to remain in the community, then the third stage of evaluation focuses attention on social aspects and lifestyle opportunities.

6.2.2 Analysis of Preference Rankings

6.2.2.1 Preference Profiles

Whereas the bipolar adjectival rating scales focus on evaluation of the community of residence only, the preference rankings assess the study community in the context of seven other Manitoba towns. The first stage of analysis of the preference rankings is the examination of the frequency distributions of responses of each sample. The first and last preferences for the eight communities are

shown in Figure 15. For both groups, Thompson is the most frequently first-ranked community, although a greater level of preference is expressed by the longer-term residents. Both groups also identify Winnipeg and Brandon as the second and third most frequently ranked first-choice community respectively. The least preferred community for long-term and short-term residents is overwhelmingly identified as Churchill. However, The Pas is assigned the lowest ranking by 12 percent of the respondents in each group.

6.2.2.2 Multidimensional Scaling Analysis of Preference

The second stage of the analysis of preferences is the multidimensional scaling analysis. The two-dimensional configurations obtained for residents in the two "length of residence" categories are shown in Figure 16[65]. For respondents of less than five years residence, two clusters are evident. The first includes Thompson, Lynn Lake, and Churchill (i.e. northern resource towns), while the other is comprised of The Pas, Winnipeg, Leaf Rapids and Brandon. The cluster of northern resource towns does not include Leaf Rapids, which offers a key to the interpretation. The three communities in the first cluster (Thompson, Lynn Lake and Churchill) have all suffered economic decline in recent years, with consequent out-migration and general community

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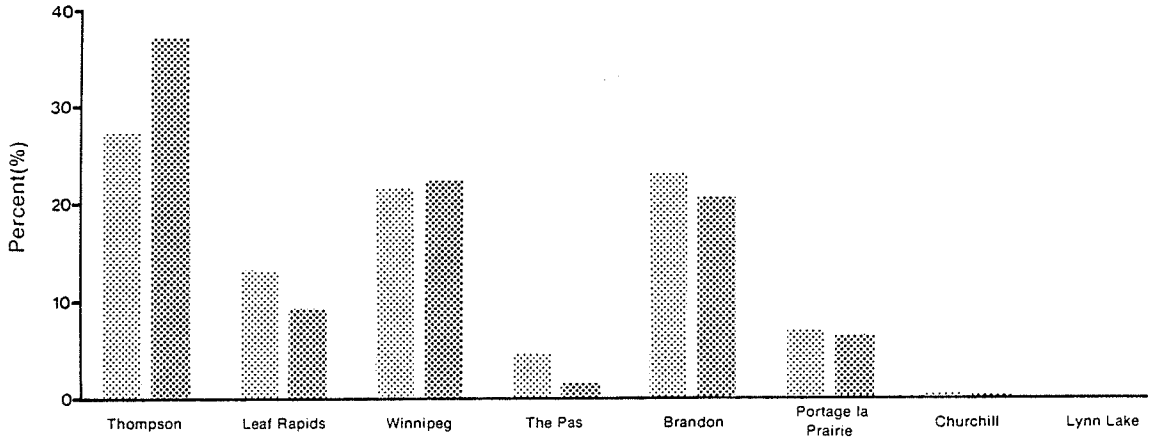
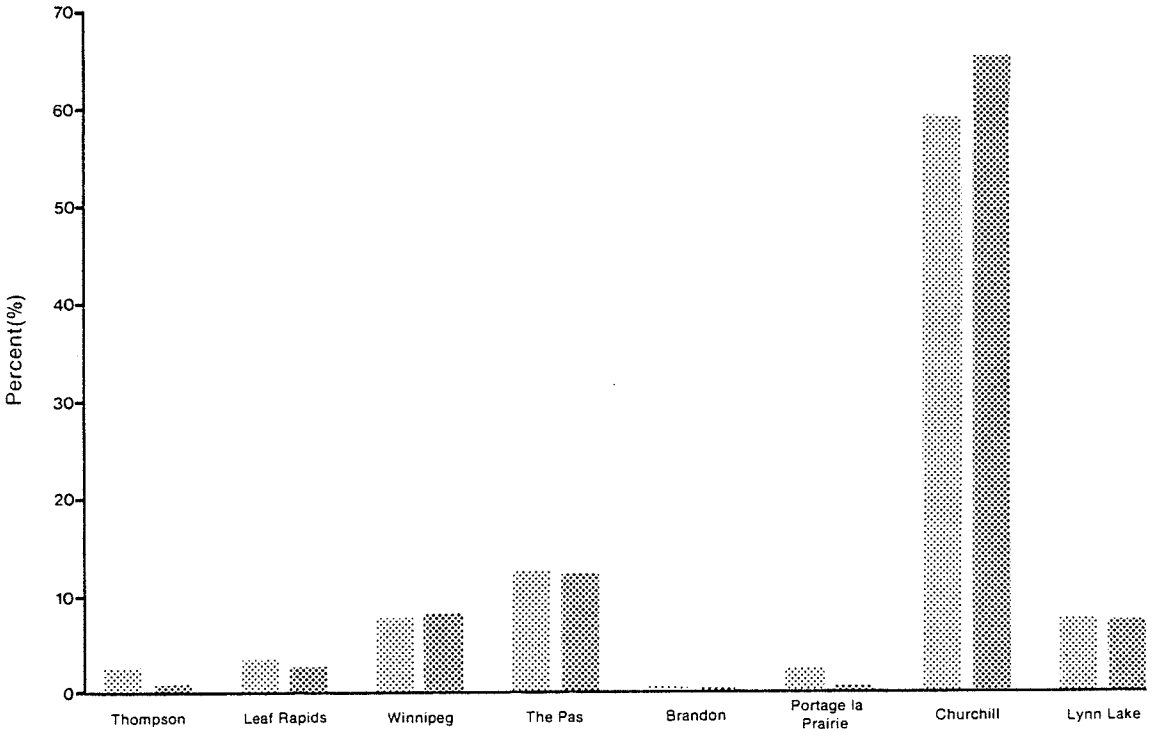
[65] The configurations are based on responses from the following subamples: less than five years residence n=34, five years or more residence n=42.

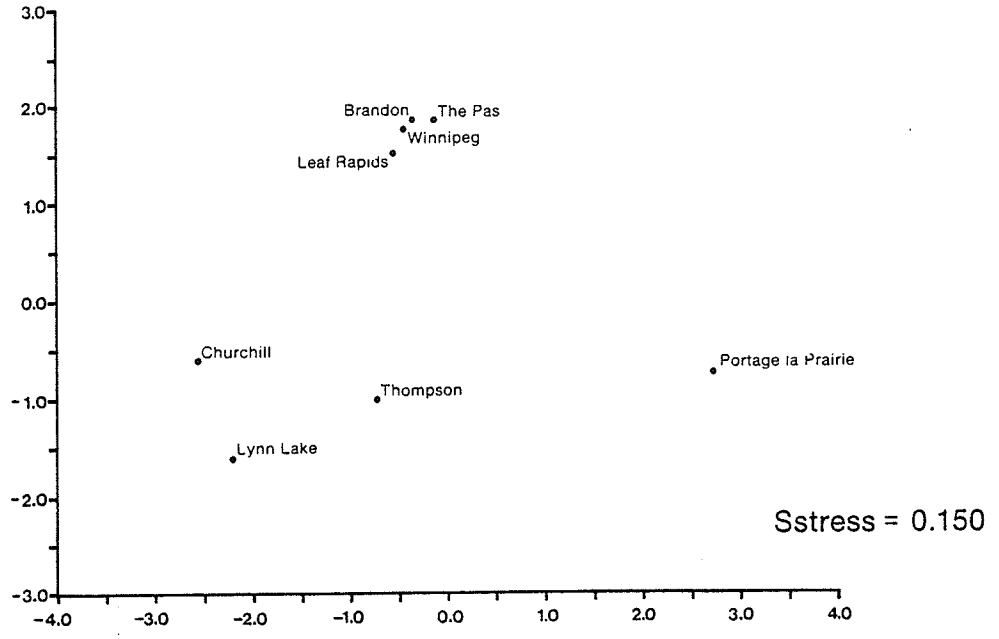


a) First Preference

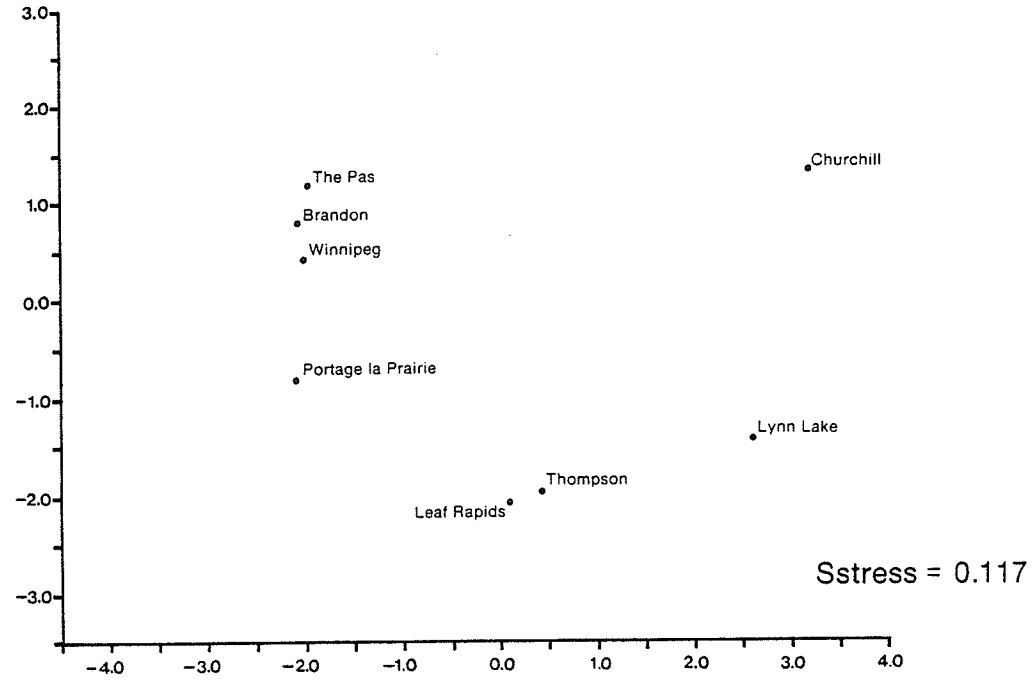


b) Last Preference

Figure 15. Length of Residence: First and Last Preferences for Selected Manitoba Communities



a) Less Than 5 Years Residence



b) 5 Years Residence and Over

Figure 16. Length of Residence: Two-Dimensional Preference Configurations

depression[66]. One basis of distinction between the two clusters therefore appears to be economic health or stability. This interpretation reveals some consistency with previous research findings on place utility (Section 2.1.2.2), in that these eight Manitoba communities were ranked in the context of potential migration destinations. As a result, it might be expected that economic factors would be of importance.

In the configuration for longer-term residents, Leaf Rapids is included with other northern communities along an apparent diagonal dimension that appears to distinguish northern resource towns from settlements in southern Manitoba. The Pas, although considerd by many Manitobans to be a northern resource town, is associated with other southern communities. This is perhaps a reflection of its function as a service center for surrounding agricultural areas, and greater degree of accessibility to the south[67]. The clearer distinction of northern and southern communities by longer-term residents may express a greater appreciation of the northern environment and a sense of identity (and possibly pride) as "northern residents". In most cases, respondents who have lived in the north longer than five

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[66] The data were collected in 1980 when the economic well-being of Leaf Rapids appeared stable. The possibility of mine closure, disclosed during the latter part of 1981, was not evident during the data collection stage.

[67] The economy of The Pas is largely based on forest industries.

years will have chosen not to return to the south, preferring the northern lifestyle. In the analysis of the rating scales, Component 2 (see Section 6.1.1) supports the contention that longer-term residents do recognise northern resource communities as having a distinct identity. This is also significant in relationship to the suggestion by Sonnenfeld (1982) that an increased "sense-of-place" varies inversely with social egocentricity, which the present findings suggest is associated with short length of residence.

6.2.3 Summary of Findings Concerning Length of Residence

There appears to be some support for the hypothesised differences between the community images of long-term and short-term residents. Specifically, the proposition that community-related factors are a more significant dimension in the structuring of images of long-term residents is implied. It was anticipated that this would be reflected in a concern for more objective aspects of the community environment, such as schools and medical facilities. Instead, community concern appears to focus on social dimensions of community identity. The emphasis of short-term residents on functional characterisitics of the community environment indirectly supports the hypothesis that personal aspirations rather than community-related factors are of greatest significance as the results imply a lack of concern for social or community oriented factors.

6.3 TEST OF HYPOTHESIS CONCERNING SEX AND MARITAL STATUS

Many social variables potentially influence the formation of community images. The two variables selected for examination in this study, on the basis of their apparent significance to population mobility in northern resource towns, are sex and marital status. Hypothesis 5 states in a very general form:

> that the images of northern resource communities are related to the residents' sex and marital status.

6.3.1 Differences in Sex

6.3.1.1 Analysis of the Bipolar Adjectival Rating Scales

Mean response ratings on the bipolar scales (Figure 17 and Table 13) generally reveal that women have more negative images of northern communities than men. In particular, scales relating to shopping facilities, choice of goods, housing availability, secondary schools, medical facilities, transportation to the south, and job security all received lower mean ratings from female respondents. On the other hand, outdoor recreational facilities and scenic quality were rated higher by women. The two sets of rating scale data are next separately analysed using principal components analysis (Tables 14 and 15)[68]. For the male respondents, three major components are extracted which explain 29.1 percent of the total variance. The first component explains

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[68] Complete listings of factor loadings on the significant components are presented in Appendix D.

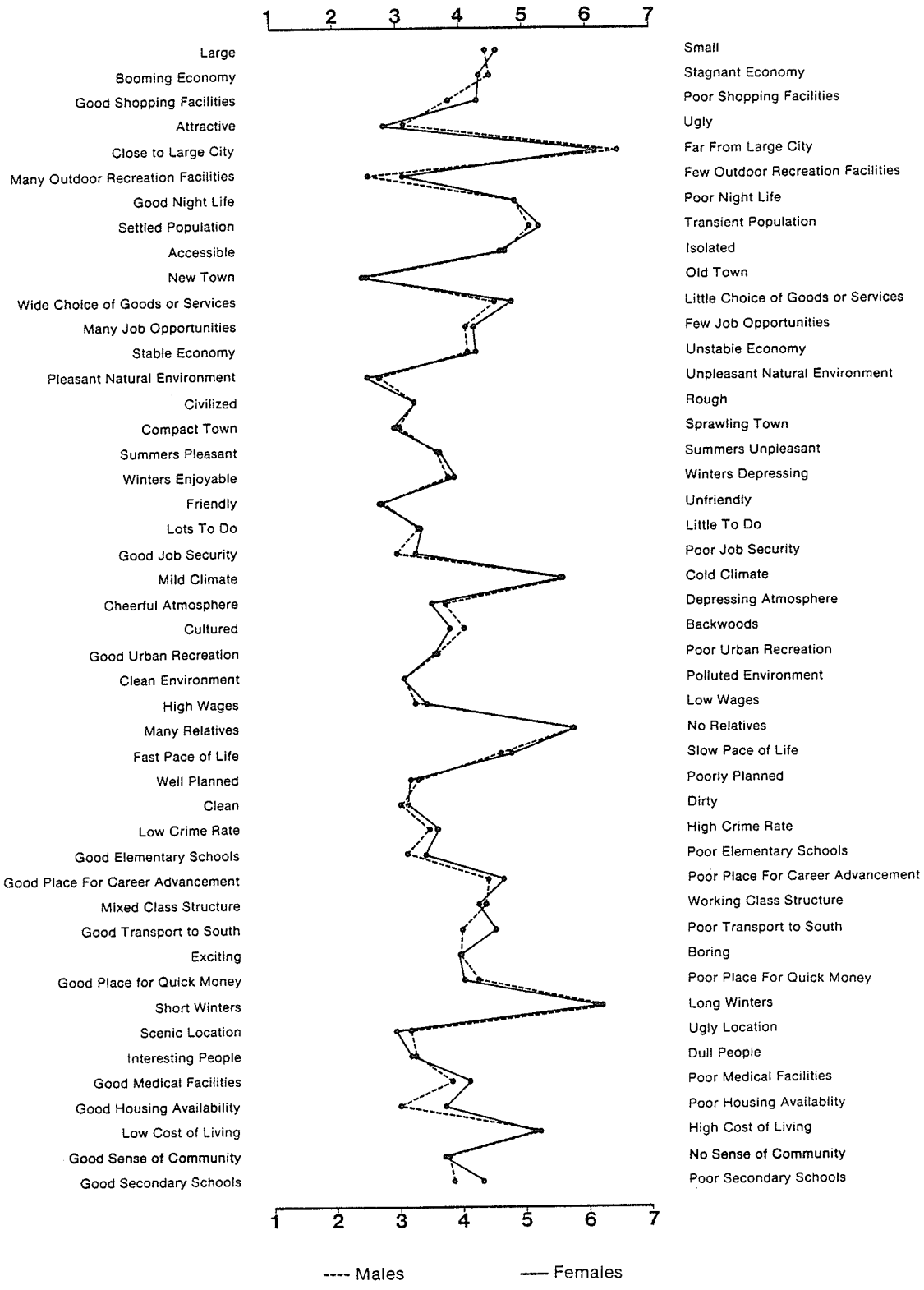

Figure 17. Differences in Sex: Mean Reponses to the Rating Scales

Table 13: Differences in Sex: Responses to Rating Scales

No.	Scale	Male (n=177) $\bar{X}$	Male (n=177) Sd	Female (n=223) $\bar{X}$	Female (n=223) Sd
1.	Large-Small	4.41	1.26	4.58	1.29
2.	Booming-Stagnant Economy	4.49	1.35	4.32	1.28
3.	Good-Poor Shopping Facilities	3.84	1.46	4.24	1.69
4.	Attractive-Ugly	3.11	1.33	2.78	1.33
5.	Close-Far from Large City	6.50	1.02	6.17	1.45
6.	Many-Few Outdoor Recreation Facilities	2.56	1.58	3.09	1.83
7.	Good-Poor Night Life	4.88	1.51	4.83	1.71
8.	Settled-Transient Population	5.11	1.46	5.29	1.67
9.	Accessible-Isolated	4.71	1.82	4.62	1.85
10.	New-Old Town	2.51	1.30	2.42	1.34
11.	Wide-Little Choice of Goods or Services	4.56	1.60	4.84	1.61
12.	Many-Few Job Opportunities	4.09	1.68	4.20	1.64
13.	Stable-Unstable Economy	4.13	1.53	4.27	1.61
14.	Pleasant-Unpleasant Natural Environment	2.74	1.50	2.53	1.44
15.	Civilised-Rough	3.29	1.51	3.28	1.44
16.	Compact-Sprawling Town	3.01	1.65	2.95	1.67
17.	Summers Pleasant-Unpleasant	3.63	1.59	3.68	1.63
18.	Winters Enjoyable -Depressing	3.81	1.80	3.95	1.74
19.	Friendly-Unfriendly	2.74	1.37	2.71	1.40
20.	Lots-Little To Do	3.33	1.73	3.38	1.71
21.	Good-Poor Job Security	2.99	1.52	3.29	1.64
22.	Mild-Cold Climate	5.63	1.29	5.60	1.35
23.	Cheerful-Depressing Atmosphere	3.76	1.44	3.52	1.42
24.	Cultured-Backwoods	4.07	1.58	3.84	1.29
25.	Good-Poor Urban Recreation	3.63	1.68	3.58	1.70
26.	Clean-Polluted Environment	3.08	1.70	3.07	1.65
27.	High-Low Wages	3.28	1.41	3.47	1.38
28.	Many-No Relatives	5.79	1.85	5.79	1.85
29.	Fast-Slow Pace of Life	4.61	1.44	4.81	1.37
30.	Well-Poorly Planned	3.33	1.70	3.20	1.60
31.	Clean-Dirty	3.05	1.49	3.63	1.48
32.	Low-High Crime Rate	3.48	1.42	3.65	1.53
33.	Good-Poor Elementary Schools	3.13	1.65	3.42	1.84
34.	Good-Poor Place for Career Advancement	4.46	1.80	4.67	1.73
35.	Mixed-Working Class Structure	4.38	1.73	4.26	1.68
36.	Good-Poor Transport to South	4.00	1.90	4.53	1.90
37.	Exciting-Boring	3.98	1.53	3.96	1.24
38.	Good-Poor Place for Quick Money	4.26	1.80	4.02	1.77
39.	Short-Long Winters	6.22	1.16	6.16	1.31
40.	Scenic-Ugly Location	3.21	1.67	2.95	1.66
41.	Interesting-Dull People	3.26	1.42	3.18	1.37
42.	Good-Poor Medical Facilities	3.84	1.88	4.10	1.88
43.	Good-Poor Housing Availability	3.00	1.72	3.72	1.94
44.	Low-High Cost of Living	5.26	1.42	5.21	1.44
45.	Good-No Sense of Community	3.76	1.49	3.68	1.46
46.	Good-Poor Secondary Schools	3.88	1.69	4.35	1.77

Table 14. Summary of varimax-rotated component loadings: male respondents

Component	Loading	Total variance explained
1. Urban Amenities		16.4%
1. large-small	0.65	
3. good-poor shopping facilities	0.64	
42. good-poor housing availability	0.60	
43. good-poor medical facilities	0.52	
2. Social Environment		7.6%
41. interesting-dull people	0.75	
15. civilised-rough	0.60	
19. friendly-unfriendly	0.59	
45. good-no sense of community	0.58	
3. Northern Recreational Environment		5.1%
20. lots-little to do	0.69	
18. winters enjoyable-depressing	0.65	
6. many-few outdoor recreation facilities	0.63	
37. exciting-boring	0.62	

16.4 percent of the variance and has scales loading on it relating to "Urban Amenities". These scales include shopping facilities, medical facilities, and housing availability. As "community-size" also loads strongly (0.65) on this component it would appear that the level of provision of these amenities is viewed as a function of size. The second component is labelled as "Social Environment" (7.6 percent of total variance). Loading on this component are such scales as interesting/dull people, friendliness, degree of "civilisation", and sense of community. The third component identifies the "Northern Recreational Environment". The scales which are associated with this component are outdoor recreation and enjoyment of winter, in conjunction with more general activity measures including exciting/boring and lots/little to do.

In general, the female responses disclose many similarities to those of the male respondents. To some extent this may reflect the greater proportion of married respondents, with evaluations frequently being expressed within a family context. The first component (14.4 percent of the total variance) also identifies those urban facilities associated with community size. However, there is a broader range of scales loading on this component than in the case of the male reponse. Although shopping facilities, medical facilities, and housing availability are again prominent, urban recreational facilities, choice of

Table 15. Summary of varimax-rotated component loadings: female respondents

Component	Loading	Total variance explained
1. Urban Amenities		14.4%
43. good-poor housing availability	0.70	
1. large-small	0.67	
3. good-poor shopping facilities	0.58	
11. wide-little choice goods or services	0.58	
45. good-no sense of community	0.55	
25. good-poor urban recreation	0.54	
42. good-poor medical facilities	0.52	
2. Physical Environment		8.5%
14. pleasant-unpleasant natural environment	0.78	
4. attractive-ugly	0.70	
15. civilised-rough	0.65	
30. well-poorly planned	0.52	
3. Recreational Environment		5.2%
20. lots-little to do	0.66	
18. winters enjoyable-depressing	0.61	
6. many-few outdoor recreation facilities	0.53	
23. cheerful-depressing atmosphere	0.51	
37. exciting-boring	0.51	

goods, and sense of community are also included. These differences perhaps reflect the greater importance of the urban environment to women, since it is a more significant component of their everyday lifestyle. Whereas many male respondents spend considerable time in their work environment (which in many cases is at the mine site), many of the women are more closely associated with the urban environment. The second component extracted for female respondents relates to the physical environment and explains 8.5 percent of the total variance. High loadings are registered by scales associated with the attractiveness, pleasantness of the natural environment, the urban planning, and the civilised/rough nature of the community. As in the case of the male respondents, the third component (5.2 percent of total variance) is related to the recreational environment.

The main difference between the male and female responses appears to be the lesser concern of females for the social environment and a greater emphasis on the functional environment. This may reflect the closer orientation of married women to home and family. Both males and females, however, identify the significance of urban amenities and outdoor recreational facilities in community evaluation.

6.3.1.2 Analysis of Preference Rankings

Differences among the preference ratings of Manitoba towns are also evident when comparing responses of males and females. (Figure 18). Thompson is most frequently ranked as the "most preferred community" by both male and female respondents. However, 28 percent of male respondents mention Winnipeg as their first choice compared with only 16 percent of female respondents. For female respondents, Brandon is chosen as most preferred by 24 percent and Leaf Rapids by 18 percent. For both groups, Churchill is most frequently ranked as the least popular place to live.

The MDS configurations (Figures 19a and 19b) further reveal the differences that exist between male and female respondents[69]. The males identify a cluster of communities consisting of Winnipeg, Brandon, Lynn Lake and Leaf Rapids. This is perhaps an identification on the basis of such economic considerations as job opportunity. Female respondents, on the other hand, locate Winnipeg, Brandon and The Pas in a similar region of the space, with a looser cluster consisting of the northern communities of Thompson, Leaf Rapids, Lynn Lake and Churchill. This indicates an overall "north-south" distinction, although its basis is uncertain. The results of the principal components analysis of the rating scale (see Section 6.3.1) do, however, reveal

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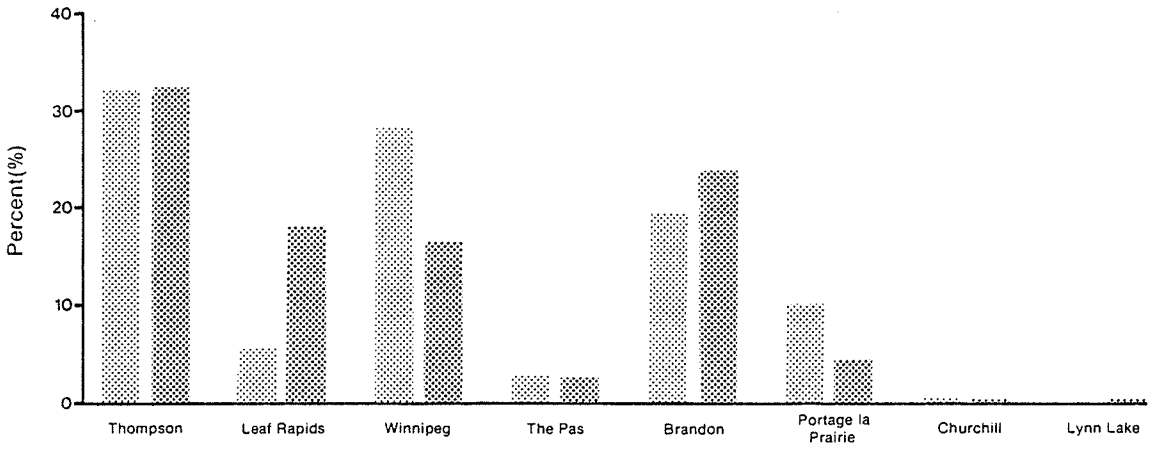
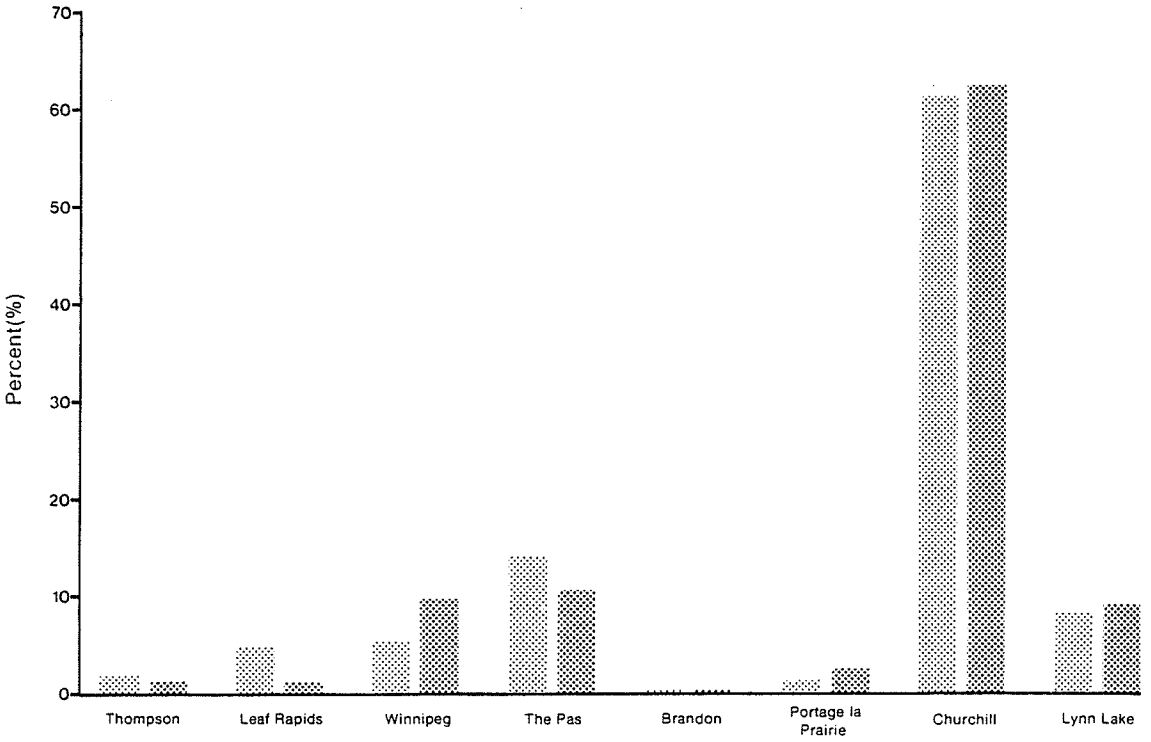
[69] The configurations are based on responses from the following subsamples: male respondents n=55, female respondents n=66.



a) First Preference



b) Last Preference

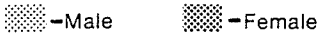
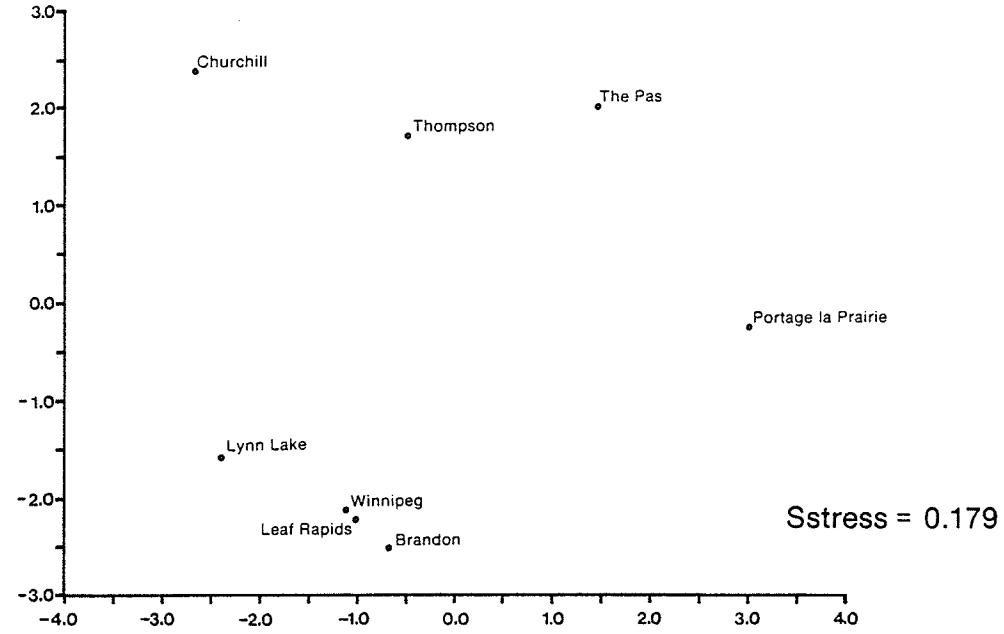
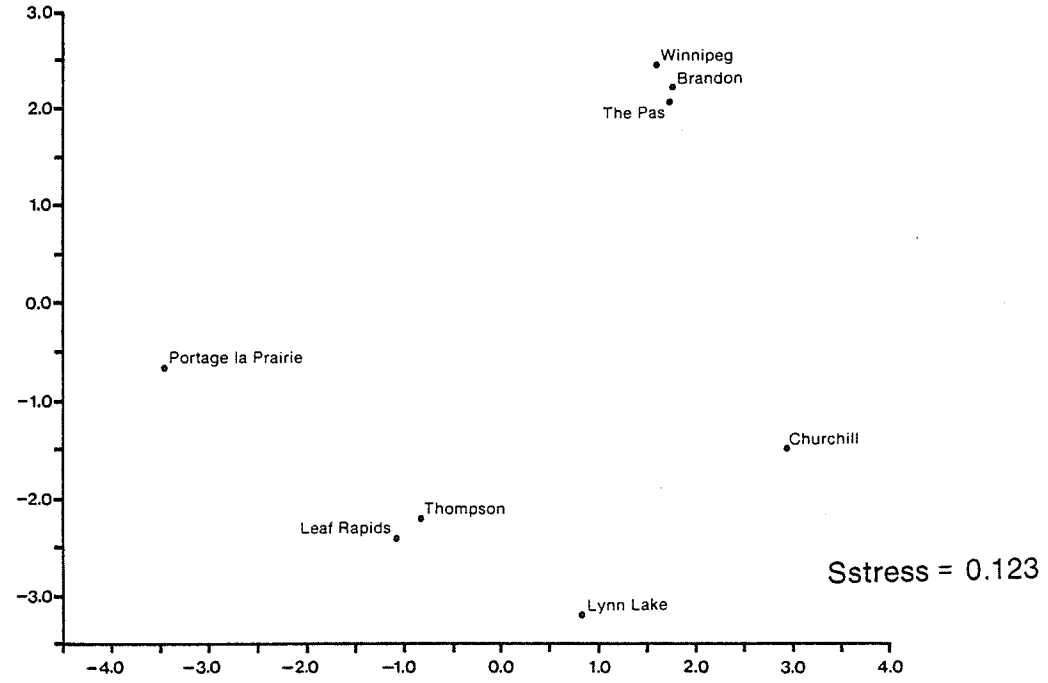


Figure 18. Differences in Sex: First and Last Preferences for Selected Manitoba Communities



a) Male



b) Female

Figure 19. Differences in Sex: Two-Dimensional Preference Configurations

that female respondents emphasise the physical/functional components of the urban environment,and these may also be significant in the assignment of preference rankings. Generally, it appears that female respondents identify the unique character of northern communities more distinctly than their male counterparts who appear to view job opportunity as a more significant basis of community evaluation.

6.3.2 Differences in Marital Status

6.3.2.1 Analysis of the Bipolar Adjectival Rating Scales

The second social variable which has been hypothesised to influence the nature of the community image is marital status. Mean responses to the bipolar rating scales (Figure 20 and Table 16) reveal slightly higher ratings of the communities by single people. Most noticeable variations in response relate to economic factors with single persons rating wages, career advancement, and opportunities for quick money somewhat higher than do married respondents. Nightlife and the interesting character of the people were also rated higher by single respondents. The presence of more relatives and a higher assessment of medical facilities may be a reflection of age in addition to marital status. A number of the single repondents have their families living in Thompson or Leaf Rapids and remained in the communities to work after completing their schooling. Lower ratings of

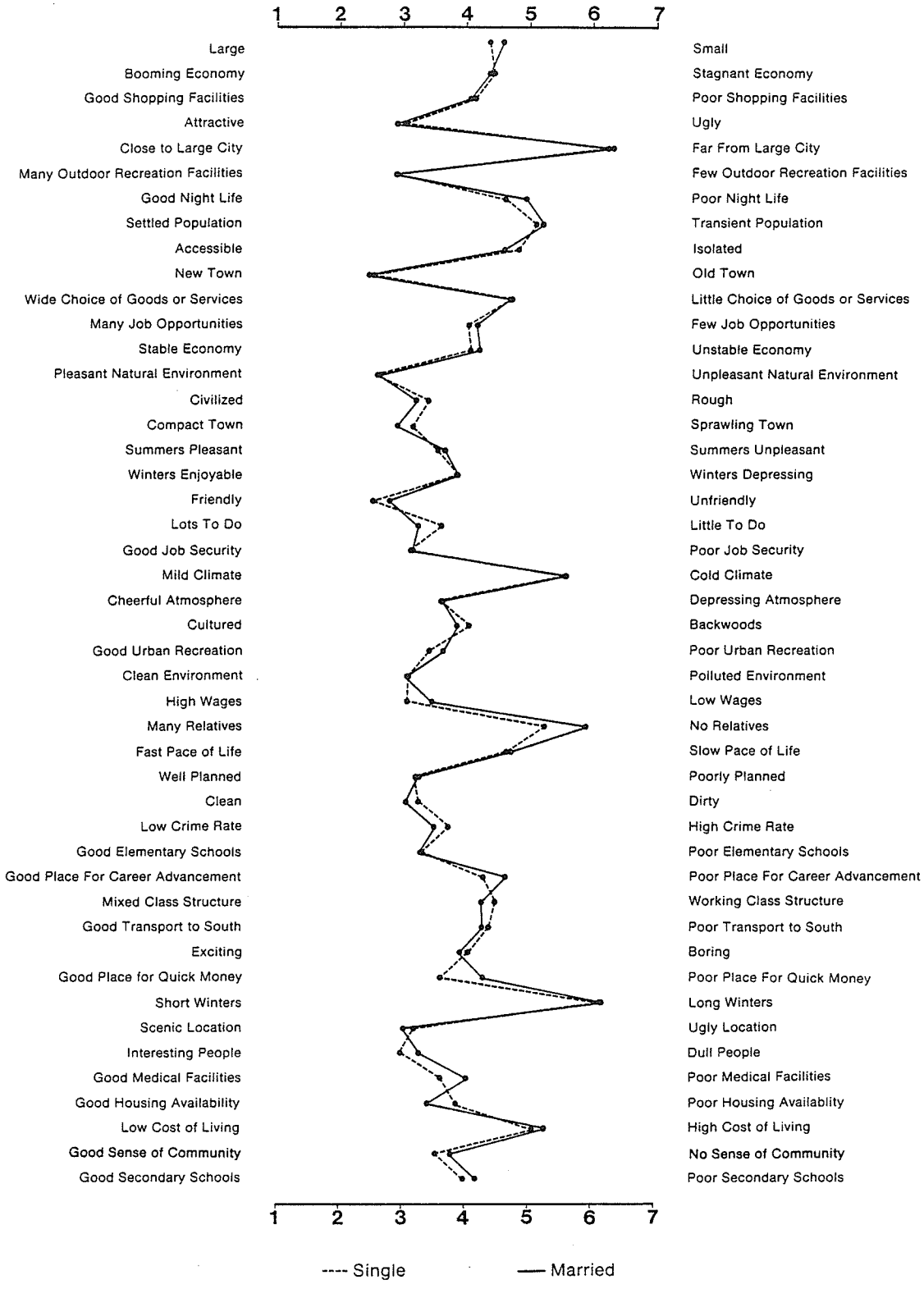


Figure 20. Marital Status. Mean Responses to the Rating Scales

Table 16. Marital Status: Responses to Rating Scales

No.	Scale	Married (n=296) $\bar{X}$	Married (n=296) Sd	Single (n=103) $\bar{X}$	Single (n=103) Sd
1.	Large-Small	4.55	1.29	4.37	1.26
2.	Booming-Stagnant Economy	4.38	1.35	4.45	1.17
3.	Good-Poor Shopping Facilities	4.07	1.60	4.15	1.64
4.	Attractive-Ugly	2.88	1.33	3.05	1.36
5.	Close-Far from Large City	6.34	1.29	6.24	1.30
6.	Many-Few Outdoor Recreation Facilities	2.88	1.77	2.89	1.68
7.	Good-Poor Night Life	4.98	1.60	4.58	1.68
8.	Settled-Transient Population	5.24	1.55	5.11	1.63
9.	Accessible-Isolated	4.60	1.83	4.84	1.85
10.	New-Old Town	2.44	1.33	2.53	1.29
11.	Wide-Little Choice of Goods or Services	4.70	1.63	4.74	1.56
12.	Many-Few Job Opportunities	4.18	1.65	4.06	1.68
13.	Stable-Unstable Economy	4.24	1.56	4.09	1.61
14.	Pleasant-Unpleasant Natural Environment	2.64	1.50	2.56	1.34
15.	Civilised-Rough	3.24	1.46	3.42	1.51
16.	Compact-Sprawling Town	2.91	1.70	3.17	1.49
17.	Summers Pleasant-Unpleasant	3.69	1.60	3.56	1.65
18.	Winters Enjoyable -Depressing	3.89	1.78	3.86	1.71
19.	Friendly-Unfriendly	2.79	1.41	2.52	1.27
20.	Lots-Little To Do	3.26	1.64	3.66	1.93
21.	Good-Poor Job Security	3.16	1.60	3.13	1.58
22.	Mild-Cold Climate	5.62	1.33	5.59	1.28
23.	Cheerful-Depressing Atmosphere	3.63	1.48	3.61	1.47
24.	Cultured-Backwoods	3.89	1.45	4.10	1.37
25.	Good-Poor Urban Recreation	3.65	1.73	3.44	1.55
26.	Clean-Polluted Environment	3.06	1.70	3.10	1.58
27.	High-Low Wages	3.48	1.40	3.09	1.34
28.	Many-No Relatives	5.95	1.75	5.28	2.09
29.	Fast-Slow Pace of Life	4.74	1.40	4.66	1.41
30.	Well-Poorly Planned	3.27	1.66	3.21	1.62
31.	Clean-Dirty	3.06	1.47	3.27	1.54
32.	Low-High Crime Rate	3.51	1.46	3.76	1.56
33.	Good-Poor Elementary Schools	3.28	1.78	3.35	1.71
34.	Good-Poor Place for Career Advancement	4.65	1.74	4.29	1.81
35.	Mixed-Working Class Structure	4.25	1.60	4.50	1.73
36.	Good-Poor Transport to South	4.27	1.91	4.40	1.92
37.	Exciting-Boring	3.93	1.32	4.09	1.53
38.	Good-Poor Place for Quick Money	4.29	1.78	4.09	1.72
39.	Short-Long Winters	6.19	1.26	6.16	1.23
40.	Scenic-Ugly Location	3.01	1.69	3.23	1.59
41.	Interesting-Dull People	3.29	1.40	3.23	1.34
42.	Good-Poor Medical Facilities	4.10	1.92	3.63	1.70
43.	Good-Poor Housing Availability	3.41	1.89	3.38	1.84
44.	Low-High Cost of Living	5.30	1.45	5.00	1.35
45.	Good-No Sense of Community	3.78	1.48	3.53	1.42
46.	Good-Poor Secondary Schools	4.19	1.74	3.99	1.78

medical facilities by married respondents may be due to increased concern with such services because many have dependents which include small children.

The responses to the rating scales by both sample groups are each analysed separately using principal components analysis[70]. The components analysis of the rating scales reveals considerable differences between single and married respondents (Tables 17 and 18). For single respondents, four components are extracted (Table 17) explaining 36.9 percent of the total variance. The first component, which accounts for 15.6 percent of the total variance, is defined by such social scales as friendliness, interesting nature of the people, sense of community together with physical attractiveness. This component is labelled "Community Environment". In contrast, the second component emphasises "Urban Facilities" and explains 9.3 percent of the total variance. Scales loading strongly on this component include medical facilities, shopping facilities, housing availability, and community size. The third component (6.8 percent of total variance) has only two scales with strong loadings, the pleasantness of summers, and the cheerfulness of the community. It is therefore labelled "Summer Environment". For many people living in northern communities, the summer lifestyle, with long hours of daylight and many opportunities for outdoor recreation, is

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[70] Complete listings of factor loadings on significant components are presented in Appendix D.

Table 17. Summary of varimax-rotated component loadings: single respondents

Component	Loading	Total variance explained
1. Community Environment		15.6%
41. interesting-dull people	0.75	
45. good-no sense of community	0.73	
4. attractive-ugly	0.64	
19. friendly-unfriendly	0.62	
2. Urban Facilities		9.3%
42. good-poor medical facilities	0.76	
3. good-poor shopping facilities	0.60	
1. large-small	0.58	
43. good-poor housing availability	0.53	
3. Summer Environment		6.8%
17. summers pleasant-unpleasant	0.78	
23. cheerful-depressing atmosphere	0.59	
4. Recreational Environment		5.2%
6. many-few outdoor recreation facilities	0.77	
20. lots-little to do	0.64	
25. good-poor urban recreation	0.59	

one of the more positive aspects of life. The fourth component, in fact, explicitly relates to the "Recreational Environment", accounting for 5.2 percent of the total variance. Scales loading strongly on this component include outdoor recreational facilities, urban recreational facilities, and lots/little to do.

Three significant components, explaining 27.8 percent of the total variance, are extracted from the data set of the married respondents (Table 18). The first component is labelled "Physical Character" and includes scales associated with both the natural and urban environments. This component explains 15.3 percent of the total variance. The second component, explaining 7.7 percent of the total variance, focuses on the "Recreational Environment". The third component, with strong loadings on only two scales, size and shopping facilities, is labelled "Shopping Facilities". Although the order of importance is different, these three components are structured in a similar manner to the components extracted for female respondents. This suggests that, because of the greater proportion of married respondents who are also female, the relative influence of the two variables, sex and marital status, may not be clearly distinguishable.

In comparing the components extracted for single and married respondents, it appears that the former have a more comprehensive image of the community in which they live.

Table 18. Summary of varimax-rotated component loadings: married respondents

Component	Loading	Total variance explained
1. Physical Character		15.3%
14. pleasant-unpleasant natural environment	0.75	
4. attractive-ugly	0.72	
15. civilised-rough	0.57	
40. scenic-ugly location	0.57	
25. well-poorly planned	0.55	
2. Recreational Environment		7.7%
20. lots-little to do	0.68	
6. many-few outdoor recreation facilities	0.67	
18. winters enjoyable-depressing	0.53	
37. exciting-boring	0.52	
3. Shopping Facilities		4.9%
1. large-small	0.75	
3. good-poor shopping facilities	0.63	

Not unexpectedly, single respondents emphasise the social environment more than married respondents. However, single persons also clearly identify a broad range of urban services, whereas only shopping facilities assume importance for those who are married. Both groups clearly identify recreational facilities.

6.3.2.2 Analysis of Preference Rankings

The differences in first and last preference choices expressed by single and married respondents is seen in Figure 21. For both groups, the three most frequently mentioned first choices are Thompson, Winnipeg and Brandon. However, a greater percentage of single respondents state a preference for Winnipeg (33 percent), while married persons more frequently rank Thompson (33 percent) as the first choice. Again, the least preferred community is Churchill. However, fewer single respondents (52 percent) rank it as last choice than married respondents (65 percent). For both groups, The Pas is the next most frequently mentioned last choice.

The MDS configurations for single and married respondents are shown in Figures 22a and 22b respectively[71]. Married respondents place Thompson and Leaf Rapids in a similar part of the space. Brandon and The Pas are also in close

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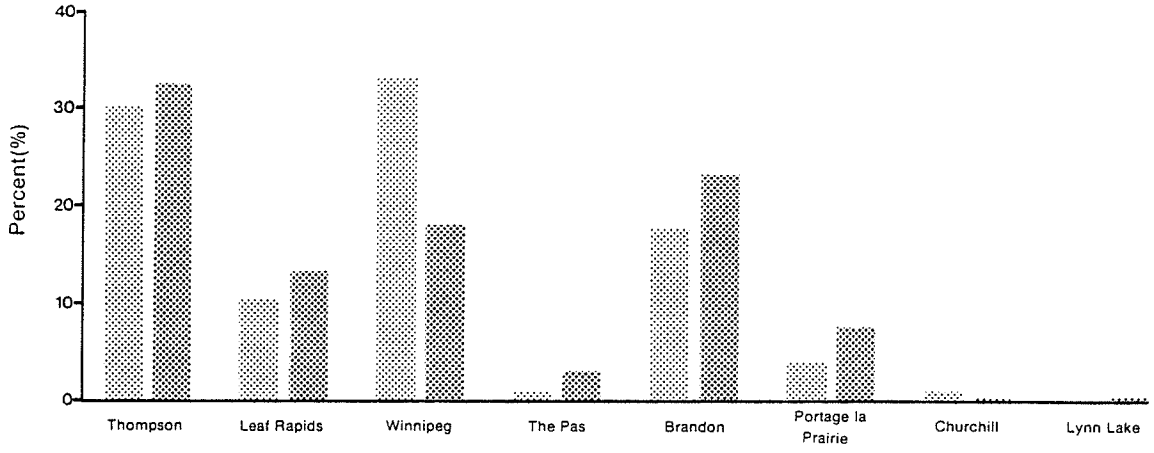
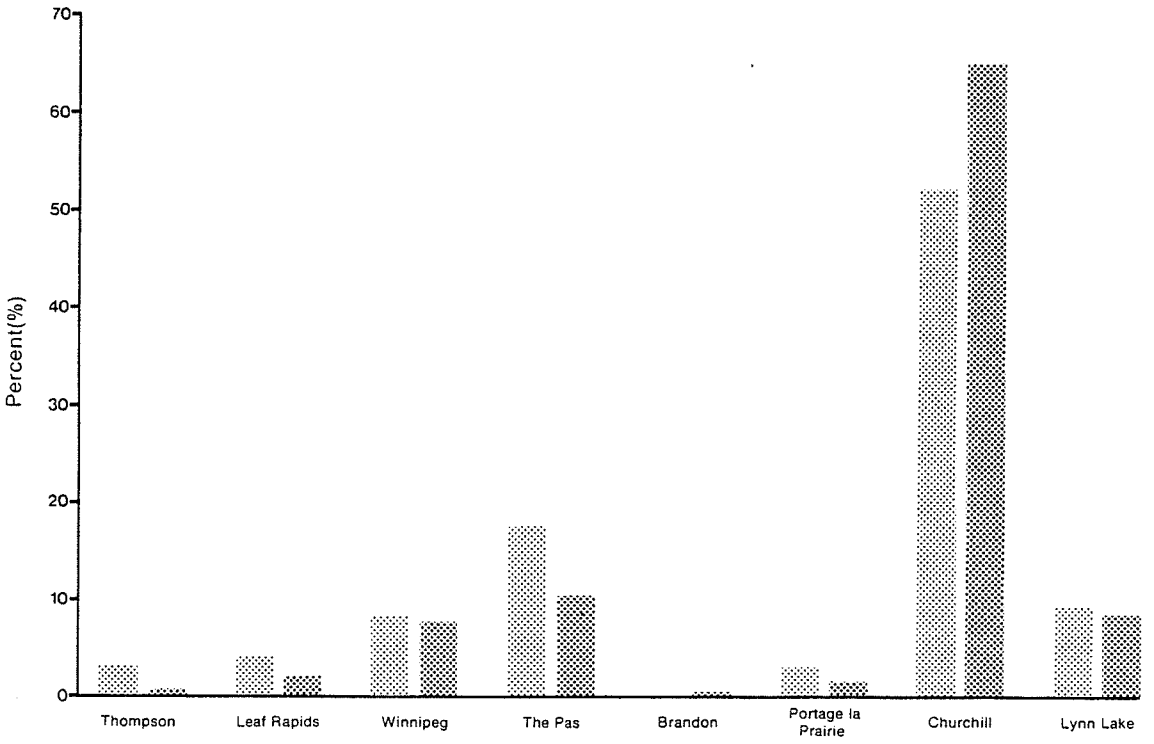
[71] The configurations are based on responses from the following subsamples: married respondents n=62, single respondents n=36.

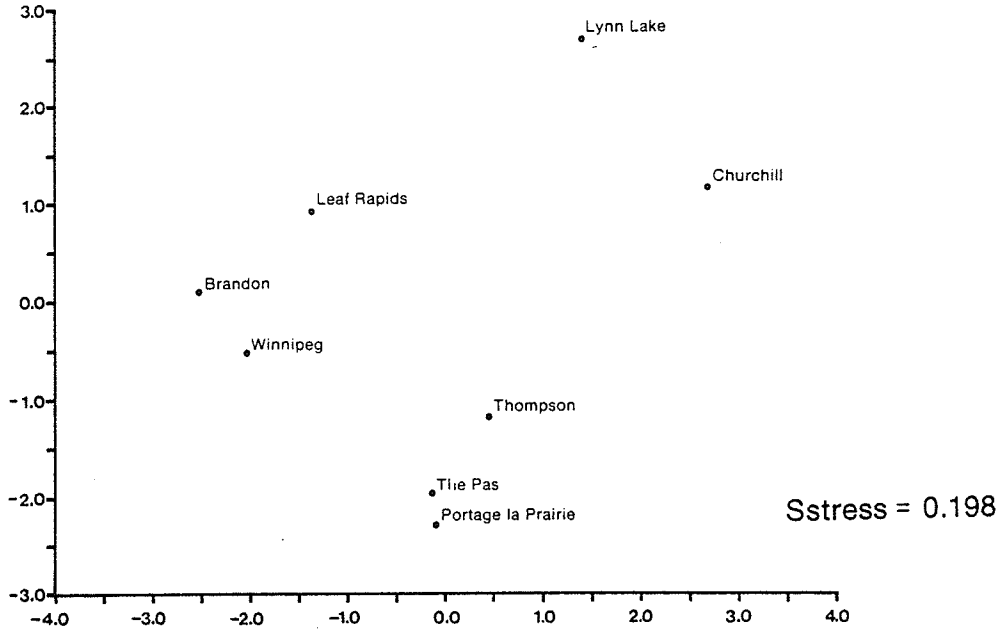


a) First Preference

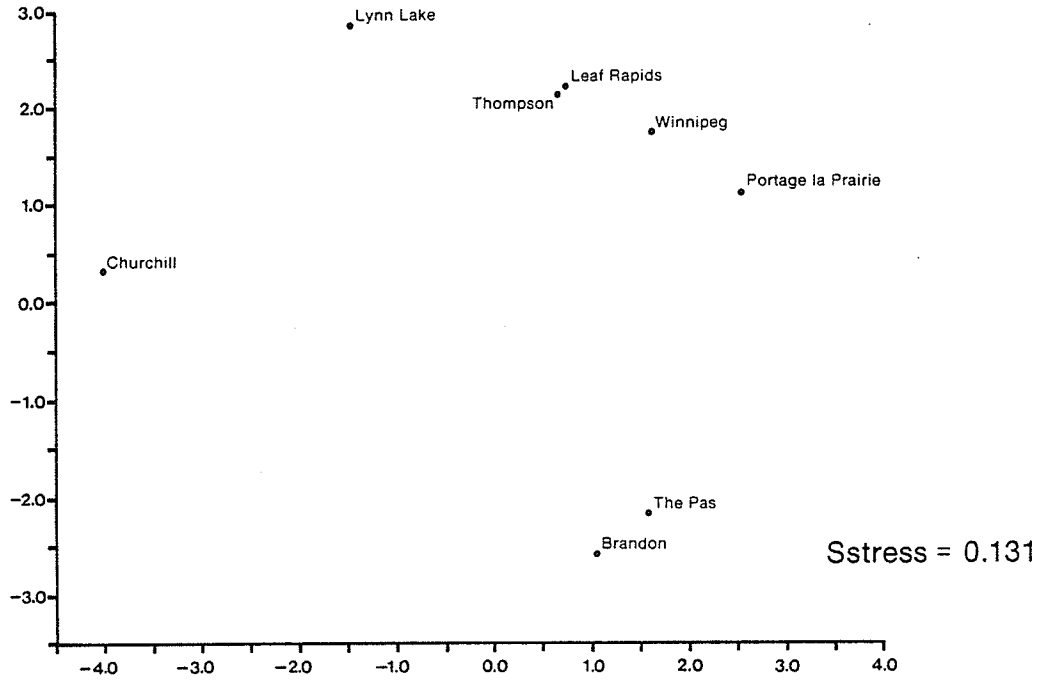


b) Last Preference

Figure 21. Marital Status: First and Last Preferences for Selected Manitoba Communities



a) Single



b) Married

Figure 22. Marital Status: Two-Dimensional Preference Configurations

proximity to each other. The configuration does not offer a readily interpretable pattern. However, if a diagonal dimension is defined with Brandon and The Pas near one pole, and Churchill and Lynn Lake near the other, this could represent a composite evaluation of characteristics relating to the suitability of the community for establishing a home and raising a family. Community characteristics such as size, housing availability, population stability, safety, and presence of relatives might be aspects associated with this dimension. On this dimension, Portage la Prairie is viewed as offering a positive family environment, while Winnipeg is judged as somewhat less desirable. This may be because respondents are more familiar with small town environments. However, northern resource towns are viewed as least desirable, although Thompson and Leaf Rapids are considered preferable to Churchill and Lynn Lake.

The configuration for single respondents reveals a scattered pattern of communities. A diagonal dimension appears to be defined by Lynn Lake and Churchill again representing one extreme, with a group including Brandon, Winnipeg, The Pas and Portage la Prairie near the other pole. Leaf Rapids and Thompson are located separately along this dimension, but closer to the extreme represented by the "southern communities". Again interpretation is difficult, but the importance of the social environment for single persons, as suggested by the results of the components

analysis (see Section 6.3.2.1), may imply that this dimension represents the presence/absence of friends and family. Such communities as Winnipeg, Brandon, The Pas and Portage may thus represent places where many of the single respondents were raised and have friends and relatives. Their present communities of residence, Leaf Rapids and Thompson are also places in which they are likely to have friends, although probably fewer family members. On the other hand, Lynn Lake and Churchill are probably communities in which they have no acquaintances whatever.

6.3.3 Summary of Findings Concerning Sex and Marital Status

The hypothesis that sex and marital status are significant variables influencing the nature of the community image appears to be supported. The effects of sex differences are reflected by the females' greater awareness of the physical/functional characteristics of the northern environment compared with their male counterparts who view the communities primarily in social and economic terms. Variations in the community image due to marital status are expressed mainly in terms of the greater emphasis that single persons place on the social environment.

Chapter VII

SUMMARY AND CONCLUSIONS

The purpose of this study is to investigate the community images of residents of Thompson and Leaf Rapids, Manitoba. Specifically, the objectives of the thesis are to determine whether the dimensions of residents' images are influenced by community environments, length of residence, sex and marital status. These do not necessarily represent all of the variables which may influence the nature of the image, but they are selected on the basis of previous research findings and their assumed significance in the context of northern resource communities.

The objectives and related hypotheses are outlined in Chapter 1. This is followed by a brief discussion of the field of behavioral geography and a clarification of terms pertinent to the thesis. The first chapter concludes with a presentation of the conceptual organisation of the study. Chapter 2 offers a review of relevant literature relating to studies of the environmental image, and of northern Canadian resource communities. The derivation of the hypotheses is presented in Chapter 3, followed by a discussion of the repertory grid technique. The study area and data sources are outlined in Chapter 4. In Chapter 5, the analytical

procedures are explained, and the hypothesis relating to differences in present community environment is tested. The hypotheses concerning the experiential and social characteristics of residents are tested in Chapter 6. In this chapter, an overview of the research findings is presented. The conceptual contributions of the study are then assessed, and directions are offered for future related research. To provide a background for these discussions, the research design is first presented and assessed.

7.1 RESEARCH DESIGN

A basic premise of this study is that common images of northern resource towns are not shared by all residents. The concept of the "image" implies, in fact, that each individual uniquely responds to environmental stimuli. This is further emphasised by the adaptation of repertory grid methodology (Kelly, 1955) in the research design. Nevertheless, Kelly (1955) did indicate in the "commonality corollary" of personal construct theory that individuals may employ similar constructs, and subsequently group images have been identified by many researchers (e.g. Klein, 1967; Appleyard, 1970; Everitt and Cadwallader, 1972; Devlin, 1976; Townsend, 1977). The aim of the study is to examine selected variables which may be significant in the identification of group images. Five hypotheses are formulated. Three of these hypotheses propose that the

dimensions of community images are related to differences in present community environment, past residential experience, and sex and marital status. The other two hypotheses concern the effects of length of residence in the community on the image. Specific aspects of the image are examined in relation to each hypothesis. First, the designative and evaluative aspects of the image are assessed in terms of ratings on 46 bipolar scales. These scales are derived from personal constructs elicited during a preliminary field survey of residents in the two communities. The hypotheses are tested by conducting a descriptive analysis of the scaled responses and by subjecting them to a principal components analysis. Second, a further aspect of the image is investigated concerning preference which, although a subset of evaluation, is considered separately in this study. Preference data are expressed in the form of rank-orderings of eight Manitoba communities. To test the hypotheses, these data are analysed using both descriptive statistics and MDS.

Personal construct theory (Kelly, 1955) provides a conceptual basis for a major part of the research design. Using repertory grid methodology, constructs are elicited from a sample of residents in northern resource towns. The more frequently used triad method of elicitation is adapted to employ dyads. This does not detract from the validity of the technique, but proves useful in the eliciting of

constructs where respondents possess varying degrees of familiarity with the place elements. To further reduce this problem, the originally prepared list of places is refined to ensure that all respondents have some knowledge of each of them.

A similar problem is encountered in the selection of places used to elicit preference judgments. In the context of northern resource towns, this problem is especially acute as nearly all residents are migrants with diverse backgrounds of residential experience. Selection of sets of places about which respondents are required to make relative judgments requires care. In particular, the places must be sufficiently familiar to respondents so that they may perform the desired tasks.

A multidimensional unfolding procedure is employed to examine the cognitive structuring of the preference rankings of the eight Manitoba communities. Although it is usually desirable to confine rank-order judgments to a fairly small set of elements, this proved to be rather limiting when attempting to determine the underlying structure of the image. Subjectively identifying and labelling the dimensions of MDS configurations is frequently problematic . In the present study, this was particularly difficult because all of the selected communities are located in Manitoba and, in the context of all possible types of settlement, offer a limited diversity of characterisitics.

Two other factors also appear to contribute to interpretational difficulties. First, two-dimensional configurations are obtained since these represent a compromise between the degree of stress and ease of interpretation. There are indications, however, that place imagery is an extremely complex phenomenon. For instance, no fewer than 46 different constructs were elicited during the initial testing. Therefore, two-dimensional configurations may not be adequate for interpretation on a purely dimensional basis. Kruskal and Wish (1976) indicate that clustering of points frequently occurs when a two-dimensional solution is obtained for data whose appropriate dimensionality is higher. Consequently, in most cases interpretation of the configurations is based on assessment of "neighbourhoods" or clusters[72].

A second factor which presents interpretational difficulties is the heterogeneous nature of the respondents. This creates problems because differing group images, as a result of the varied personal characterisitics of the respondents, reduces the clarity of the configuration. This problem is previously noted by Palmer (1978), and in many instances researchers employing MDS techniques prefer to focus on the responses of homogeneous samples (e.g. Burnett,

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[72] Guttman (1965) argues that the neighbourhood approach is preferable to the traditional dimensional approach. Kruskal and Wish (1976) suggest, however, that one should employ any means possible. Thus, the neighbourhood interpretation should be used to supplement and clarify the dimensions rather than compete with them.

1973; Lieber, 1977).

Despite the problems associated with employing psychometric techniques to large data sets, both personal construct theory and MDS appear to be useful methods for investigating environmental cognition. Personal construct theory appears to offer an acceptable theoretical framework within which to study the image. To some extent, the problems of applying this technique to large samples of respondents can be circumvented by taking advantage of the flexibility of the theory. Substitution of a dyad format for the more frequently employed triad procedure of construct elicitation, and the use of standard elements, are ways in which aggregated responses from larger samples of respondents can be accommodated. These adaptations do reduce the sensitivity of the repertory grid to individual differences, but have advantages over other techniques (e.g. the semantic differential) since researcher bias is reduced.

The use of MDS techniques also reduces possible bias that may be introduced by the researcher. In the present study, the large heterogeneous sample restricted the application of this technique to that of a supportive role. However, the conjunction of personal construct theory and MDS has been suggested by several researchers (Harman and Betak, 1976; Palmer, 1978) as a useful solution to the interpretational problems associated with MDS.

In addition to the purely methodological issues discussed above, there are several limitations to the research design which must be taken into consideration when assessing the research findings. For instance, the time frame within which the data were collected imposes several constraints when attempting to assess the significance of adaptation to the environment. In particular, the effects of length of residence on the nature of the image can only be examined by considering the responses from a cross-section of the population at one point in time. Ideally, a longitudinal study is required in which responses are obtained from individuals at several stages of residential experience. This type of study could best be conducted under the auspices of the resource company since this would not only permit a priori identification of future residents, but also allow closer monitoring of the subjects' migration intentions.

In the present study, respondents were randomly selected by household from the entire population of both communities. While producing a statistically valid sample, this did impose some limitations in the examination of the effects of length of residence. The original aim of the sampling design was to selectively sample the population on the basis of length of residence. Identification of very recent residents to the communities, however, proved impossible as both company records and most government sources of such

information are confidential. A dichotomous classification of residents on the basis of length of residence is employed in the study. The distinction between those of less than five years residential experience, and those of five years or more, is related in a very general way to assumptions concerning migration decision-making. A third age-group, however, appears meaningful. This would include those who have lived in the community for less than one year, whose images are likely to differ substantially from all other "long-term" residents. Specifically, residents of less than one year have had less time to adapt to the northern environment and will likely make evaluative judgments of the community with greater reference to their previous place of residence.

In terms of the time frame of the study, a further concern is the time of year that the data were collected. This may have particular significance in the context of northern communities where seasonal variations are extreme. Several studies (Nickels and Kehoe, 1972; Riffel, 1975) indicate an association between mental health and climate. Thus, it is likely that community evaluation may also vary seasonally. Data for the present study were collected during the summer months of 1980 when generally pleasant summer weather occurred. As a result, it is possible that this may have evoked more positive evaluations than might otherwise have been obtained. In the context of northern

settlements, a longitudinal study examining the resistance of evaluative constructs to seasonal changes would be useful.

7.2 RESEARCH FINDINGS

Numerous variables have been shown to act as filters in transforming the objective environment to the cognitive environment or image (e.g. Klein, 1967; Saarinen, 1969; Orleans and Schmidt, 1972; Tranter and Parkes, 1979; Hourihan, 1979). In this study, a restricted set of profile variables is selected for examination on the basis of existing theory and empirical work. The findings are first summarised as a basis for the subsequent discussion of the contribution of the research to existing knowledge, and the implications for future investigation.

7.2.1 Community Environment

The responses of Thompson and Leaf Rapids residents are compared to determine the effects of present community environment upon the image. The hypothesis states:

> that the dimensions of residents' images of Thompson and Leaf Rapids are related to community environment.

Tests of the designative and evaluative aspects of the community images appear to support this hypothesis. Objective characteristics of the two communities (e.g. "size" and "level of services") appear to be accurately

assessed when the Thompson and Leaf Rapids responses are compared. For example, Leaf Rapids residents assess their community as smaller than do Thompson residents, and express more negative evaluations of community services (e.g. "shopping" and "medical facilities"). Higher ratings of the quality of the natural environment by Leaf Rapids residents would also appear to express an accurate evaluation of actual community differences. It is more difficult to evaluate the veridicality of those aspects of the image which do not relate directly to the physical environment. However, two scales: "degree of community isolation", and "friendliness of the community", produce responses that are unexpected. Leaf Rapids residents do not consider their home community to be any more isolated than Thompson residents despite the fact that it is located on a gravel road 212 kilometers northwest of Thompson and has more limited transportation services. They also assign lower ratings to their community in terms of its friendliness which appears contrary to the general assumption that smaller communities are friendlier.

In general, the image dimensions disclosed by principal components analysis indicate a greater emphasis on the social environment by Leaf Rapids residents. This may relate to the absence of many urban services present in larger communities. The results also suggest that "size" appears to represent a basic superordinate construct. Even

the apparent greater awareness of the natural environment exhibited by Leaf Rapids residents is best understood in terms of size-related attributes. In Leaf Rapids, residents are much more exposed to the non-built environment on a daily basis than are Thompson residents.

The analysis of the preference aspect of the image also suggests that "size" is an important construct. The descriptive analysis of the preference rankings reveals that a higher proportion of Thompson respondents prefer their "home community". A possible explanation for this may be found with reference to the ratings on the bipolar scales which suggest that Leaf Rapids respondents consider their community too small for permanent residence. On the other hand, Thompson is more frequently ranked as first choice among Manitoba communities, and appears to be considered by many as a relatively permanent place of residence. This proposition is further supported by the MDS configurations for the two communities which suggest the importance of "home" and "family environment".

Two aspects of <u>previous residential experience</u> are examined: the location of the place in which respondents were born, and the size of the community in which they were raised. The hypothesis states:

> that the dimensions of residents' images of northern resource towns are influenced by the size and location of the communities in which they were born and raised.

In general, the hypothesis is supported. Specifically, it would appear that the size of the community in which one is raised acts as a basic frame of reference. The differences between that community and the present place of residence are then emphasised. Thus, residents raised in small towns stress the role of urban amenities, while those from larger communities place greater emphasis upon the natural environment. The degree of familiarity with the home community is also suggested as an explanation for differences in response. For instance, the images of Manitoba-born residents focus on social attributes (e.g. the presence of friends and relatives) rather than the physical environment. This finding can perhaps be reconciled with the results concerning length of residence which indicate that, in reponse to increased familiarity with the northern environment, the significance of physical attributes is diminished. The major problem in assessing the influence of previous residential experience is that it is a cumulative process for each individual. All past experience is therefore of relevance in establishing the frame of reference within which the present community is assessed (Wohlwill and Kohn, 1973).

7.2.2 Length of Residence

Two hypotheses are tested regarding the effects of length of residence on the community image:

> that short-term residents' images of northern resource communities are related to personal aspirations rather than community-related factors;
>
> that longer-term residents' images of northern resource communities are predominantly structured in terms of community-related factors.

For short-term residents, the results of the principal components analysis reveal a concern with the physical characteristics of the community including level of urban amenities, quality of the natural environment, and activity opportunity. The analysis of preferences indicates that the economic health of the community is also of importance. These findings tend to offer support for the hypothesis that personal aspirations rather than community-related factors are of significance in image formation of short-term residents. It is likely that a secure economic situation provides the basis for engaging in the desired personal lifestyle. However, in order for an individual to benefit fully from this economic well-being, the community environment must be congruent with the desired lifestyle. Thus, recreational opportunities and urban amenities (e.g. shopping and entertainment facilities) are significant aspects of short-term residents' images.

The dimensions of the longer-term residents' images appear to offer support for the second hypothesis concerning

length of residence. Social constructs appear to acquire greater significance than physical constructs with increased length of residence. This finding appears to be consistent with studies of environmental adaptation which suggest that over time people become habituated to the physical environment (Sonnenfeld, 1967; Wohlwill and Kohn, 1973). Environmental adaptation frequently involves acceptance of (or resignation to) negative factors (Appleyard and Lintell, 1972; Lawson and Walters, 1974). In the context of northern resource towns, the negative factors emphasised by short-term residents (e.g. the limited choice of goods, housing, and medical facilities) are not significant aspects of longer-term residents' images. Additionally, the community focus of longer-term residents' images is suggested in the clearer "northern" identity they attribute to their home community.

7.2.3 Sex and Marital Status

Sex and marital status are considered to be two social variables which are particularly important in the context of northern resource communities. It is therefore hypothesised:

> that the images of northern resource communities are related to the residents' sex and marital status.

With reference to differences in sex, the most significant finding concerns the greater emphasis that females place on

the functional and natural environments. It would appear that whereas men view the community largely in relationship to social activity, women stress urban amenities and other functional attributes. Differences in response between married and single respondents are less easy to categorise although, not unexpectedly, single residents place a greater emphasis on the social environment. In the case of married respondents, communities are primarily assessed in the context of family needs. Thus, a composite dimension relating to concerns such as housing, education, safety, and presence of relatives identifies the basis of community evaluation. These results support previous findings (Rossi, 1955; Hourihan, 1979; Preston and Taylor, 1981a), and suggest that family life cycle is one of the more significant variables affecting residential evaluation.

7.3 CONCEPTUAL CONTRIBUTIONS AND DIRECTIONS FOR FUTURE RESEARCH

In addition to the specific research findings that have been summarised, the study's contribution to the existing body of conceptual work concerning place evaluation requires examination. This section considers this contribution and suggests several areas where future research may be valuable. Two general conceptual aspects are discussed: (i) the changing dimensionality of the image in response to residential experience, and (ii) environmental influences on the "frame of reference". The section concludes with a

brief discussion of the implications of the findings for community planning and design.

Much of the existing work on the nature of place imagery focuses on the community evaluations of potential and recent migrants (Wohlwill and Kohn, 1973; Demko, 1974; Gustavus and Brown, 1977). By examining the responses of subjects with differing length of residence characteristics, the present study suggests that sequential changes in image dimensionality occur as the result of residential experience. A basic theoretical concept which suggests such changes, and provides a basis for the present research, is the Experience Corollary to Kelly's personal construct theory (1955). This is further supported by Helson's (1964) adaptation-level theory.

The findings of the present research suggest that evaluation may be conceptualised as a three-stage process. The first stage is prior to migration when economic dimensions dominate the decision-making process. The second stage occurs during the initial period of residence when the physical environment and urban amenities are considered to be of greatest importance. A third stage of evaluation, by residents who decide to remain longer in the community, occurs when the image dimensions are restructured to focus on social aspects.

This conceptualisation of the changing focus of place utility dimensions represents a development of the

suggestion by Demko (1974) that, in a potential migration context, the dimensions of place utility change to non-economic factors once some basic level of economic satisfaction is reached. Further support for the three-stage process is offered in studies relating to social egocentricity (Packard, 1972; Ziller, 1973). These suggest that over time the egocentric focus of place imagery (which in the present study is seen as being reflected in concern for the physical and functional environment) is replaced by greater community concern. Further research is needed not only to empirically examine the validity of this three-stage process in other environmental contexts, but to determine how much residential experience is required before the change from the second stage to the third stage occurs.

Related to the findings concerning the effects of length of residence on the dimensions of the image are those associating the nature of the image with the location of birthplace. The results suggest that the main component of the community image for Manitoba-born respondents is defined in terms of social rather than physical criteria. This suggests that long-term residential experience results in a decrease in the significance of "familiarity with the physical environment" as a factor in place evaluation. These inferences may have relevance to existing work on migration decision-making concerning the relationship of familiarity and preference (Gould, 1966; Brown, et al., 1977).

In the present study, the concept of the "frame of reference" within which place evaluations are made is considered in relation to both present and past environmental experience. Due to the limited amount of existing empirical work relating to this concept (Wohlwill and Kohn, 1973, 1975), the hypotheses tested are of a general exploratory nature and the findings can only be expressed in a speculative manner. The results do, however, suggest directions for future research. For instance, the mean responses on the rating scales reveal (when viewed comparatively) fairly predictable community profiles which generally reflect objective differences between the two towns. It may be surmised from this that residents employ similar reference frames which include adjacent communities. However, a more detailed examination of responses on the rating scales reveals that, while a general conformity to the objective environment does exist, there are discrepancies in the magnitudes of judgments. In particular, the results indicate that residents tend to locate attributes of their "home community" in relatively centralised positions along bipolar scales, thus implying that the individuals' present environmental context is considered as the "norm".

These results are very speculative and for each individual the concept of the "frame of reference" is undoubtedly a composite of previously experienced

environments. For example, the present study also shows a relationship between birthplace and image dimensionality. Some aspects of the concept of the frame of reference which appear to warrant further invesigation include: (i) an examination of whether a particular experienced environment (e.g. the most recent previous place of residence or the childhood environment) dominates the reference frame; (ii) the effect of environmental adaptation in establishing the local environment as the most significant aspect of the frame of reference.

In general, the findings of the present study thus point to the importance of environmental adaptation in community evaluation. This is an area in which little geographic research has been conducted. New hypotheses suggested by the findings of the study are:

1. that familiarity with the environment, either as the result of increasing length of residence or previous residential experience, reduces the significance of the physical environment as a dimension in place evaluation;
2. that individuals employ a frame of reference to evaluate their present environmental situation which employs neighbouring places as "reference communities";
3. that individuals tend to consider their present environmental situation as the "norm" and locate

attributes of their community in relatively centralised positions along bipolar dimensions.

Although of a very general nature, the findings do offer some implications for community design. Creating urban environments which reduce turnover rates has been an objective in the recent planning of these communities. The design of Leaf Rapids represents one of the most recent innovative attempts to design a community specifically adapted to the northern environment. Relatively little attempt has been made, however, to examine subjective elements such as residents' evaluations of their communities.

The findings of the present study offer some indications of the significant dimensions employed by various groups of residents in the structuring of their community images. The main design implications result from examination of image differences between residents of the two study communities. There is a general indication the residents of northern communities seek the "best of both worlds". That is, while expressing a positive response to the northern environment, they nevertheless express concern for the provision of adequate urban amenities and services. However, service level is directly related to community size and, if the community is too small, there is little that planners can do to promote stability. Further research is thus needed to determine if a threshold community size can be specified in

relationship to residential satisfaction. The present research indicates that Thompson (with a population of around 15,000) is large enough to encourage long-term residence, but that Leaf Rapids (with a population of only 2,500) may be too small for this. In most cases, the size of a resource community is determined by the economic resource base, and is thus beyond the control of the planner. However, design considerations may be relevant if it is recognised that a threshold community size is a necessary condition for a stable population. For example, the specific housing needs of short-term residents require investigation by designers and architects. This concern is supported by a recent situation in Leaf Rapids where there was demand by residents for more mobile home facilities. Generally, dissatisfaction with small communities appears to focus on the lack of urban services and facilities. Therefore, a further aspect of research might consider company subsidization of such services.

The findings concerning the effects of length of residence on the community image also have implications for urban planning. With increased residential experience, the importance of the physical environment appears to diminish. Studies relating to community design should therefore pay particular attention to the attitudes and preferences of newer residents, to whom aspects of the physical environment appear to be of greater importance. Residents' opinions are

frequently expressed through such formalised community structures as town councils and school boards. However, due to increasing community involvement with extended residential experience, these organisations may not adequately represent the attitudes of newer in-migrants. Alternate methods may thus be required to elicit the opinions of more recent residents.

The ultimate aim of planners is to design communities which are congruent with the desired lifestyles of the residents. This will hopefully increase residential satisfaction and stabilize the population. Research into the structures of residents' community images is an essential step towards the assessment of those aspects of the environment which significantly influence behavior. The findings of this study offer some preliminary guidelines for further research directed at achieving a better understanding of the preferences and needs of people in northern Canadian resource towns. Further testing of the dimensions of community images is needed within different environmental contexts before such findings can be formally translated into defining design objectives.

This research, by examining the significance of cognitive structures relating to community evaluation and preference is intended to provide some direction for the development of improved community design in northern resource towns. If residential satisfaction can be increased through improved

environmental design, then ultimately a greater degree of population stability may be achieved. Appropriate input into the planning process focusing on residents' cognitive structures is an essential step towards achieving this goal. The acceptance by planners of the value of behavioral research to the planning process is dependent upon continuing interdisciplinary investigation into cognitive processes. Specifically, psychometric research techniques need adapting and refining to create more appropriate mechanisms for examining responses to the larger-scale environment. Additionally, concepts and existing theories require more extensive and rigorous testing in a variety of environmental settings. It is hoped that the present research contributes to these objectives.

Appendix A

PERSONAL CONSTRUCT THEORY

Kelly (1955, 103-104) outlines personal construct theory as follows:

(a) Fundamental Postulate: A person's processes are psychologically channelized by the ways in which he anticipates events.

(b) Construction Corollary: A person anticipates events by construing their replications.

(c) Individuality Corollary: Persons differ from each other in their construction of events.

(d) Organisation Corollary: Each person characteristically evolves, for his convenience in anticipating events, a construction system embracing ordinal relationships between constructs.

(e) Dichotomy Corollary: A person's construction system is composed of a finite number of dichotomous constructs.

(f) Choice Corollary: A person chooses for himself that alternative in a dichotomised construct through which he anticipates the greater possibility for extension and definition of his system.

(g) Range Corollary: A construct is convenient for the anticipation of a finite range of events only.

(h) Experience Corollary: A person's construction system varies as he successively construes the replication of events.

(i) Modulation Corollary: The variation in a person's construction system is limited by the permeability of the constructs within whose ranges of convenience the variants lie.

(j) Fragmentation Corollary: A person may successively employ a variety of construction subsystems which are inferentially incompatible with each other.

(k) Commonality Corollary: To the extent that one person employs a construction of experience which is similar to that employed by another, his psychological processes are similar to those of the other person.

(l) Sociality Corollary: To the extent that one person construes the construction processes of another he may play a role in a social process involving the other person.

Appendix B

THE FINAL QUESTIONNAIRE

The University of Manitoba

Department of Geography

Winnipeg, Manitoba
Canada R3T 2N2

May, 1980

Dear Sir or Madam,

I would like to ask for your help and participation in a research program which is being carried out within the Department of Geography, University of Manitoba. The aim of the research is to attempt to find out how people in Thompson and Leaf Rapids feel about living in these communities, and how they compare these towns to others they have lived in or are familiar with.

The attached questionnaire should be completed by only ONE member of the household (either the head of the household or the spouse as requested by the interviewer). It will take approximately half an hour to complete. Instructions on how to complete each section are included in the questionnaire. However if you have problems with any parts leave that section blank until the interviewer returns to collect the questionnaire, at which time he/she will assist you in completing it.

You are not required to personally identify yourself anywhere on the questionnaire and all information collected will be treated in a strictly confidential manner. No individual answers will be identified in the report. When you have fully completed the questionnaire please seal it in the envelope provided, which will further protect the confidentiality of your response.

If you wish to check the validity of the survey, please contact the Department of Geography at 474-9256. Results of the study will be available to the communities in approximately eighteen months time.

Thank you in advance for your kind cooperation.

Yours very truly,

Alison Gill
Department of Geography

AG:sb

SECTION I

This first section is concerned with obtaining some general background information about you and your family. When answering each question, please place a check mark in the appropriate space unless instructed otherwise.

1. How long have you lived in Thompson?

   _____ years _____ months

2. Are you MALE _____ FEMALE _____?

3. Are you the head of the household? YES _____ NO _____

4. Are you MARRIED (or equivalent) _____ SINGLE _____?

5. How many children do you have living at home with you in each of the following categories?

   _____ under school age

   _____ elementary school age

   _____ secondary school age

   _____ older, but still living at home.

6. What is your occupation? _____

7. What is the occupation of your spouse? _____

8. Do you OWN _____ or RENT _____ the residence in which you live?

9. In what type of residence do you live?

   _____ suite or apartment

   _____ house (single family dwelling)

   _____ dormitory

   _____ mobile home

   _____ Other

SECTION 2

This section deals with how you feel about the community in which you live. Below are pairs of descriptive words or phrases which are opposites. Indicate how you would describe Thompson by placing a check mark in the appropriate space on the scale. For example in the case of the pair "good shopping facilities" - "poor shopping facilities", if you think that Thompson's facilities are not very good then you might place a check mark at space 6 to indicate this:

good shopping	____	____	____	____	____	✓	____	poor shopping
facilities	1	2	3	4	5	6	7	facilities

If on the other hand you think that they are neither particularly good or particularly bad you would place a check at the mid-point, at space 4.

1. Large	____	____	____	____	____	____	____	Small
	1	2	3	4	5	6	7	
2. Stagnant	____	____	____	____	____	____	____	Booming economy
economy	1	2	3	4	5	6	7	
3. Good shopping	____	____	____	____	____	____	____	Poor shopping
facilities	1	2	3	4	5	6	7	facilities
4. Ugly	____	____	____	____	____	____	____	Attractive
	1	2	3	4	5	6	7	

5.	Close to large city	1	2	3	4	5	6	7	Far from large city
6.	Many outdoor recreation facilities	1	2	3	4	5	6	7	Few outdoor recreation facilities
6.	Good night life	1	2	3	4	5	6	7	Poor night life
8.	Settled population	1	2	3	4	5	6	7	Transient population
9.	Accessible	1	2	3	4	5	6	7	Isolated
10.	New town	1	2	3	4	5	6	7	Old town
11.	Wide choice of goods or services	1	2	3	4	5	6	7	Little choice of goods or services
12.	Few job opportunities	1	2	3	4	5	6	7	Many job opportunities
13.	Unstable economy	1	2	3	4	5	6	7	Stable economy

14.	Unpleasant	_____	_____	_____	_____	_____	_____	_____	Pleasant
	natural	1	2	3	4	5	6	7	natural
	environment								environment
15.	Rough	_____	_____	_____	_____	_____	_____	_____	Civilized
		1	2	3	4	5	6	7	
16.	Compact town	_____	_____	_____	_____	_____	_____	_____	Spawling town
		1	2	3	4	5	6	7	
17.	Summers	_____	_____	_____	_____	_____	_____	_____	Summers
	Pleasant	1	2	3	4	5	6	7	unpleasant
18.	Winters	_____	_____	_____	_____	_____	_____	_____	Winters
	enjoyable	1	2	3	4	5	6	7	depressing
19.	Unfriendly	_____	_____	_____	_____	_____	_____	_____	Friendly
		1	2	3	4	5	6	7	
20.	Lots to do	_____	_____	_____	_____	_____	_____	_____	Little to do
		1	2	3	4	5	6	7	
21.	Good job	_____	_____	_____	_____	_____	_____	_____	Poor job
	security	1	2	3	4	5	6	7	security
22.	Cold climate	_____	_____	_____	_____	_____	_____	_____	Mild climate
		1	2	3	4	5	6	7	

23.	Cheerful atmosphere	1	2	3	4	5	6	7	Depressing atmosphere
24.	"Cultured" environment	1	2	3	4	5	6	7	"Backward" environment
25.	Poor urban recreation facilities	1	2	3	4	5	6	7	Good urban recreation facilities
26.	Clean environment	1	2	3	4	5	6	7	Polluted environment
27.	Low wages	1	2	3	4	5	6	7	High wages
28.	Many relatives living here	1	2	3	4	5	6	7	No relatives living here
29.	Fast pace of life	1	2	3	4	5	6	7	Slow pace of life
30.	Poorly planned	1	2	3	4	5	6	7	Well planned
31.	Dirty	1	2	3	4	5	6	7	Clean

32.	High crime rate	1	2	3	4	5	6	7	Low crime rate
33.	Good elementary school facilities	1	2	3	4	5	6	7	Poor elementary school facilities
34.	Poor place for career advancement	1	2	3	4	5	6	7	Good place for career advancement
35.	Mixed class structure	1	2	3	4	5	6	7	Working class structure
36.	Good transportation facilities to south	1	2	3	4	5	6	7	Poor transportation facilities to south
37.	Exciting	1	2	3	4	5	6	7	Boring
38.	Poor place for quick money	1	2	3	4	5	6	7	Good place for quick money
39.	Short winters	1	2	3	4	5	6	7	Long winters
40.	Scenic location	1	2	3	4	5	6	7	Ugly location

41.	Dull	_____	_____	_____	_____	_____	_____	_____	Interesting
	people	1	2	3	4	5	6	7	people
42.	Good medical	_____	_____	_____	_____	_____	_____	_____	Poor medical
	facilities	1	2	3	4	5	6	7	facilities
43.	Poor housing	_____	_____	_____	_____	_____	_____	_____	Good housing
	availability	1	2	3	4	5	6	7	availability
44.	Low cost	_____	_____	_____	_____	_____	_____	_____	High cost
	of living	1	2	3	4	5	6	7	of living
45.	No sense of	_____	_____	_____	_____	_____	_____	_____	No sense of
	community	1	2	3	4	5	6	7	community
46.	Good secondary	_____	_____	_____	_____	_____	_____	_____	Good secondary
	school	1	2	3	4	5	6	7	school
	facilities								facilities

SECTION 3.

This section deals with your decision to move to Thompson and your intentions about whether or not you will stay.

1. What was the major reason you decided to move to Thompson? (Check only one)

_____ job availability

_____ better job

_____ friends and/or relatives living here

_____ attractive natural environment

_____ better life style

_____ other (please state) _____

2. How did you obtain information about Thompson before you moved here? (Check any that are applicable)

_____ friends or relatives

_____ company information

_____ newspaper, T.V. or other media source

_____ lived here previously

_____ Other (please state) _____

3. How much longer do you plan to stay in Thompson?

_____ less than 6 months more

_____ 6 months to 1 year

_____ 1 - 3 years

_____ 3 - 5 years

_____ 5 - 10 years

_____ over 10 years

_____ undecided

SECTION 4

This section deals with how you compare Thompson to other places in which you have lived.

1. In what province or country were you born? _____

2. In what type of place did you spend most of your youth? (Check one)

   _____ Farm

   _____ Rural non-farm

   _____ Community under 1,000 population

   _____ Town 1,000 - 5,000 population

   _____ Town 5,000 - 25,000 population

   _____ Town 25,000 - 50,000 population

   _____ City 50,000 - 100,000 population

   _____ City over 100,000 population

3. List all the places in which you have lived since leaving school. List most recent first and work backwards.

Community	Province/Country
Thompson	Manitoba

SECTION 4 (Continued)

4. Now list these places (including Thompson) according to your preference as a place to live. ALSO indicate some way in which you think Thompson is different from each of these places (These differences can relate to any aspect of the communities, for example, the economy, the appearance, the people or even just a feeling).

	Preference (list communities)	Way in Which Thompson is Different (indicate one way for each community)
1st		
2nd		
3rd		
4th		
5th		
6th		
7th		
8th		
9th		
10th		

5. In comparing Thompson to the LAST community in which you lived how would you rate Thompson on each of the following aspects?

	Thompson Much Worse	Thompson Worse	Thompson The Same	Thompson Better	Thompson Much Better
Schools					
Natural Environment					
Medical Facilities					
Climate					
Shopping					

SECTION 4 (Continued)

	Thompson Much Worse	Thompson Worse	Thompson The Same	Thompson Better	Thompson Much Better
Cost of living					
Job Satisfaction					
Housing					
Entertainment					
Recreation					
Friendliness					
Transportation					
Overall Satisfaction					

SECTION 5

This last section is concerned with how you evaluate Thompson in relationship to other places in Manitoba. If you are new to the province you may know very little about some of the places but please try to complete this section based on whatever knowledge you have.

1. If you had complete freedom of choice how would you rank the following communities in terms of your preference as a place in which to live.
(Indicate with numbers 1 - 8).

_____ Thompson

_____ Leaf Rapids

_____ Winnipeg

_____ The Pas

_____ Brandon

_____ Portage La Prairie

_____ Churchill

_____ Lynn Lake

2. Now, if you had a limited choice, and had to choose between any two communities, which one of EACH pair would you choose as a place to live? (Place check mark by preferred community within each pair).

Thompson	_____	Leaf Rapids	_____
Thompson	_____	Winnipeg	_____
Thompson	_____	The Pas	_____
Thompson	_____	Brandon	_____
Thompson	_____	Portage La Prairie	_____
Thompson	_____	Churchill	_____
Thompson	_____	Lynn Lake	_____

OVER .....

SECTION 5 (Continued)

Leaf Rapids	_____	Winnipeg	_____
Leaf Rapids	_____	The Pas	_____
Leaf Rapids	_____	Brandon	_____
Leaf Rapids	_____	Portage La Prairie	_____
Leaf Rapids	_____	Churchill	_____
Leaf Rapids	_____	Lynn Lake	_____
Winnipeg	_____	The Pas	_____
Winnipeg	_____	Brandon	_____
Winnipeg	_____	Portage La Prairie	_____
Winnipeg	_____	Churchill	_____
Winnipeg	_____	Lynn Lake	_____
The Pas	_____	Brandon	_____
The Pas	_____	Portage La Prairie	_____
The Pas	_____	Churchill	_____
The Pas	_____	Lynn Lake	_____
Brandon	_____	Portage La Prairie	_____
Brandon	_____	Churchill	_____
Brandon	_____	Lynn Lake	_____
Portage La Prairie	_____	Churchill	_____
Portage La Prairie	_____	Lynn Lake	_____
Churchill	_____	Lynn Lake	_____

Appendix C: The Personal Constructs: Response Frequency

Personal Constructs		Response Frequency
1. Small	Large	25
2. Booming economy	Stagnant economy	19
3. Attractive	Ugly	18
4. Good shopping	Poor shopping	16
5. Many job opportunities	Few job opportunities	16
6. Choice of services	No choice of services	14
7. Stable population	Transient population	13
8. Close to large city	Remote from large city	13
9. New	Old	12
10. Good "night life"	Poor "night life"	12
11. Scenic	Ugly	12
12. Accesible	Isolated	12
13. Many recreational opportunities	Few recreational opportunities	12
14. Clean	Dirty	10
15. Planned	Unplanned	10
16. Quiet pace of life	Fast pace of life	9
17. Culturally sophisticated	"Backwoods"	9
18. Many relatives	Few relatives	8
19. Interesting people	Dull people	8
20. Clean environment	Polluted environment	8
21. High wages	Low wages	7
22. Cheerful	Depressing	7
23. Friendly	Unfriendly	7
24. Lots to do	Boring	7
25. Stable economy	Unstable economy	6
26. Exciting	Dull	6
27. Warm climate	Cold climate	6
28. Compact	Sprawling	6
29. Pleasant natural environment	Unpleasant natural environment	6
30. Civilized	Rough	4
31. Good place for making quick money	Poor place for making quick money	4
32. Working class population	Mixed class structure	4
33. Good transportation facilities to south	Poor transportation facilities to south	4
34. Good educational opportunities	Poor educational opportunities	4
35. Low crime rate	High crime rate	4
36. Sense of 'community'	No sense of 'community'	4
37. Winters enjoyable	Winters boring	3
38. Good job security	Poor job security	3
39. High cost of living	Low cost of living	3
40. Good housing availability	Poor housing availability	3
41. Long winters	Short winters	3
42. Good medical facilities	Poor medical facilities	3
43. Good place for career advancement	Poor place for career advancement	3

Appendix D

Varimax-rotated loadings on interpreted components.

D1. List of bipolar scales

Number	Scale
1.	Large-Small
2.	Booming-Stagnant Economy
3.	Good-Poor Shopping Facilities
4.	Attractive-Ugly
5.	Close-Far from Large City
6.	Many-Few Outdoor Recreation Facilities
7.	Good-Poor Night Life
8.	Settled-Transient Population
9.	Accessible-Isolated
10.	New-Old Town
11.	Wide-Little Choice of Goods or Services
12.	Many-Few Job Opportunities
13.	Stable-Unstable Economy
14.	Pleasant-Unpleasant Natural Environment
15.	Civilised-Rough
16.	Compact-Sprawling Town
17.	Summers Pleasant-Unpleasant
18.	Winters Enjoyable-Depressing
19.	Friendly-Unfriendly
20.	Lots-Little To Do
21.	Good-Poor Job Security
22.	Mild-Cold Climate
23.	Cheerful-Depressing Atmosphere
24.	Cultured-Backwoods
25.	Good-Poor Urban Recreation
26.	Clean-Polluted Environment
27.	High-Low Wages
28.	Many-No Relatives
29.	Fast-Slow Pace of Life
30.	Well-Poorly Planned
31.	Clean-Dirty
32.	Low-High Crime Rate
33.	Good-Poor Elementary Schools
34.	Good-Poor Place for Career Advancement
35.	Mixed-Working Class Structure
36.	Good-Poor Transport to South
37.	Exciting-Boring
38.	Good-Poor Place for Quick Money
39.	Short-Long Winters
40.	Scenic-Ugly Location
41.	Interesting-Dull People
42.	Good-Poor Medical Facilities
43.	Good-Poor Housing Availability
44.	Low-High Cost of Living
45.	Good-No Sense of Community
46.	Good-Poor Secondary Schools

D2. Thompson respondents

Scale Number	Component 1	Component 2	Component 3	Component 4	Component 5	Component 6	Component 7
1.	-0.027	0.160	0.240	0.609	0.083	0.120	-0.022
2.	0.054	0.001	-0.040	0.004	-0.110	0.208	-0.020
3.	0.120	0.096	0.285	0.638	-0.080	0.008	-0.026
4.	0.574	0.154	0.342	0.030	0.125	-0.002	-0.012
5.	-0.220	0.084	0.169	0.223	0.032	0.083	-0.570
6.	0.343	0.355	-0.030	0.132	0.030	0.004	-0.095
7.	0.280	0.161	0.570	0.046	0.047	-0.076	-0.013
8.	0.098	0.069	0.094	0.118	0.236	0.028	-0.146
9.	-0.025	0.234	0.268	0.358	0.282	-0.280	0.002
10.	0.114	0.017	0.110	0.137	0.190	0.224	0.269
11.	0.077	0.104	0.640	0.206	-0.034	0.194	0.005
12.	0.059	0.066	0.214	-0.136	0.055	0.654	0.035
13.	0.103	-0.023	0.104	0.205	0.196	0.056	0.020
14.	0.717	0.071	-0.024	0.139	0.097	-0.062	0.061
15.	0.608	0.159	0.151	-0.020	0.164	0.013	0.164
16.	0.082	0.144	-0.041	-0.031	0.261	0.007	-0.049
17.	0.069	0.341	0.007	0.396	-0.030	-0.103	-0.183
18.	0.040	0.673	-0.030	0.087	-0.040	-0.014	0.163
19.	0.585	0.316	0.010	-0.030	0.018	0.205	0.130
20.	0.297	0.563	0.183	0.135	0.031	0.015	-0.001
21.	0.171	0.294	-0.301	0.166	0.267	0.196	0.148
22.	-0.040	0.112	0.138	0.104	-0.006	0.032	-0.124
23.	0.235	0.566	0.088	0.202	0.163	0.123	0.017
24.	0.337	0.084	0.364	0.141	0.133	-0.060	0.138
25.	0.424	0.352	0.114	0.175	-0.112	0.210	-0.047
26.	0.353	0.146	0.066	0.027	0.215	0.488	-0.079
27.	0.011	-0.066	0.141	0.262	0.074	0.277	0.207
28.	-0.013	-0.048	0.183	0.171	0.100	-0.003	-0.238
29.	-0.054	0.117	0.534	0.123	0.071	0.262	0.087
30.	0.613	0.033	-0.033	0.039	0.065	0.152	-0.066
31.	0.230	0.079	0.203	0.185	0.568	0.067	0.008
32.	0.083	-0.031	-0.038	-0.035	0.729	-0.023	0.113
33.	0.024	0.191	0.128	0.213	0.146	0.167	0.696
34.	0.054	0.101	0.002	0.191	0.077	0.583	0.018
35.	-0.066	-0.010	0.082	-0.037	-0.050	0.037	-0.068
36.	0.053	0.058	0.335	0.194	0.063	-0.099	-0.061
37.	0.227	0.625	0.330	0.141	0.058	0.188	-0.007
38.	0.009	0.031	0.028	-0.116	0.038	0.015	-0.043
39.	-0.338	0.260	0.145	-0.097	0.144	0.132	-0.375
40.	0.420	0.456	0.183	0.047	-0.012	0.004	-0.031
41.	0.403	0.420	0.182	-0.049	0.098	0.282	0.144
42.	0.207	0.170	-0.060	0.542	0.065	-0.016	0.208
43.	0.127	-0.022	-0.042	0.394	0.402	0.313	0.044
44.	0.068	0.063	-0.087	0.040	0.044	0.175	0.013
45.	0.192	0.348	0.136	-0.021	0.485	0.130	-0.039
46.	-0.110	0.385	0.271	0.009	0.158	-0.067	0.462

D2. Thompson respondents (continued)

Scale Number	Component 8	Component 9	Component 10	Component 11	Component 12	Component 13	Component 14
1.	0.018	-0.189	0.090	0.028	0.004	-0.118	0.198
2.	0.154	0.066	0.779	0.046	0.050	0.055	-0.006
3.	-0.086	0.042	-0.086	-0.173	-0.049	0.176	-0.102
4.	0.048	-0.168	0.128	-0.053	0.132	-0.002	-0.070
5.	0.064	0.156	0.152	-0.053	0.134	-0.152	-0.000
6.	0.121	-0.482	-0.116	0.193	0.216	-0.022	-0.068
7.	-0.093	-0.021	0.095	0.112	-0.048	0.024	0.066
8.	-0.641	0.070	0.032	-0.183	0.213	0.109	0.180
9.	0.027	0.010	0.148	0.009	0.214	-0.016	-0.028
10.	0.280	-0.470	0.019	-0.000	0.030	-0.038	-0.219
11.	-0.047	0.057	-0.089	0.056	0.089	0.195	-0.049
12.	-0.089	0.004	0.174	0.038	0.166	-0.042	-0.095
13.	-0.367	0.026	0.641	0.073	-0.171	-0.141	-0.032
14.	0.001	-0.014	-0.021	0.131	-0.043	-0.012	0.086
15.	-0.080	0.013	0.120	-0.119	0.088	-0.057	-0.186
16.	0.620	-0.032	0.022	-0.094	-0.004	0.140	0.064
17.	0.090	0.185	0.253	0.113	-0.102	0.124	-0.235
18.	-0.015	0.134	0.013	0.005	0.221	0.024	-0.030
19.	0.081	0.269	-0.154	-0.037	-0.102	-0.039	-0.100
20.	0.069	-0.319	-0.153	0.036	0.018	0.101	0.002
21.	-0.210	0.006	-0.047	0.200	-0.391	0.185	0.141
22.	0.034	0.650	0.077	0.154	0.240	-0.036	-0.021
23.	0.160	0.153	0.146	-0.094	0.022	0.031	0.088
24.	0.247	0.198	0.112	-0.119	0.070	0.066	0.340
25.	-0.013	-0.188	-0.067	0.159	0.065	0.151	0.045
26.	-0.007	0.045	0.013	0.146	-0.052	0.423	-0.111
27.	0.172	0.030	0.000	0.652	0.135	0.005	-0.080
28.	-0.226	0.273	-0.027	0.053	0.121	-0.534	-0.108
29.	-0.000	0.075	0.003	0.046	-0.161	-0.090	0.178
30.	0.001	-0.170	0.058	-0.054	-0.017	0.168	0.020
31.	0.231	-0.127	0.106	0.018	0.026	0.163	-0.153
32.	-0.095	0.051	-0.036	0.009	0.071	-0.055	0.005
33.	0.177	-0.021	0.079	0.022	0.032	-0.066	-0.037
34.	0.070	-0.074	0.127	0.109	0.103	-0.067	0.220
35.	-0.052	0.031	-0.028	-0.018	0.033	0.033	0.829
36.	-0.021	0.111	-0.054	-0.005	0.103	0.643	0.015
37.	-0.032	-0.120	-0.059	-0.129	-0.075	0.005	0.001
38.	-0.083	0.054	0.073	0.790	-0.032	-0.009	0.005
39.	-0.122	0.146	0.081	-0.041	0.441	0.217	-0.060
40.	-0.046	-0.033	0.154	0.175	-0.125	0.059	-0.010
41.	0.177	0.130	-0.128	0.047	-0.133	-0.284	0.075
42.	-0.213	0.117	0.133	0.102	0.079	0.017	-0.047
43.	0.113	-0.124	-0.313	0.108	-0.071	0.048	-0.104
44.	-0.111	0.082	-0.061	0.055	0.782	-0.004	0.083
45.	0.180	-0.176	-0.035	0.273	-0.150	-0.035	0.140
46.	-0.261	-0.058	0.027	0.017	0.028	0.046	-0.122

D3. Leaf Rapids respondents

Scale Number	Component 1	Component 2	Component 3	Component 4	Component 5	Component 6	Component 7	Component 8
1.	-0.056	-0.064	0.492	0.581	-0.062	0.060	-0.018	0.179
2.	0.064	0.157	-0.109	0.006	-0.213	-0.047	0.125	0.022
3.	0.200	0.065	0.051	0.747	-0.006	-0.040	-0.009	0.030
4.	0.203	0.747	-0.036	-0.203	0.018	0.089	0.104	0.168
5.	0.091	-0.230	0.476	0.302	0.172	0.319	0.023	0.235
6.	0.703	0.292	-0.119	0.070	-0.109	-0.023	0.103	0.130
7.	0.555	0.066	0.382	0.127	-0.066	0.121	0.168	0.096
8.	0.059	0.021	0.066	0.122	0.115	-0.120	0.001	-0.013
9.	0.268	0.001	-0.390	0.253	0.201	0.357	-0.040	0.091
10.	0.406	0.012	-0.153	0.096	0.076	-0.172	0.163	-0.337
11.	0.267	-0.119	0.096	0.556	-0.116	0.054	0.168	0.123
12.	0.151	0.129	0.184	0.145	-0.037	0.091	-0.045	0.699
13.	-0.139	0.020	0.144	-0.046	-0.034	0.015	0.044	-0.006
14.	0.193	0.763	0.139	0.168	0.030	-0.057	0.023	-0.203
15.	0.133	0.176	-0.030	0.020	0.246	0.396	0.115	-0.016
16.	0.110	-0.041	-0.473	-0.106	0.122	0.024	0.096	-0.076
17.	0.147	-0.144	-0.070	-0.062	0.046	-0.112	0.650	0.272
18.	0.721	-0.052	0.184	-0.108	0.256	0.056	-0.109	0.081
19.	0.291	0.137	-0.014	-0.051	0.543	-0.001	0.350	0.051
20.	0.721	0.173	0.040	0.145	-0.061	0.178	0.143	0.021
21.	0.133	-0.074	-0.014	0.060	0.126	0.115	0.304	-0.135
22.	0.094	-0.011	0.767	-0.045	-0.000	0.007	0.102	0.007
23.	0.348	0.251	0.135	0.100	0.444	0.136	0.282	0.032
24.	0.128	0.179	-0.034	-0.013	0.095	0.724	-0.087	-0.059
25.	0.279	0.205	0.506	0.217	0.089	0.121	-0.187	0.123
26.	0.119	0.134	-0.101	-0.114	0.147	0.040	-0.082	0.002
27.	0.208	0.396	-0.089	0.035	0.013	-0.118	-0.120	0.188
28.	0.081	-0.335	0.161	0.051	0.086	0.035	-0.180	0.018
29.	0.344	0.000	0.180	0.187	-0.220	0.464	-0.136	0.207
30.	0.130	0.600	-0.128	0.154	-0.048	0.063	0.025	0.340
31.	-0.082	0.098	-0.028	0.065	0.057	0.144	-0.079	0.175
32.	-0.031	-0.150	0.075	-0.015	0.740	-0.071	-0.068	0.116
33.	0.214	0.135	-0.387	0.224	0.314	0.352	0.000	0.073
34.	0.067	0.051	0.026	0.066	0.111	-0.038	0.204	0.729
35.	0.052	-0.136	0.143	-0.045	-0.070	0.588	0.387	0.009
36.	0.133	-0.025	0.083	0.123	0.045	0.224	0.144	0.053
37.	0.659	0.221	0.142	0.300	0.108	0.178	0.208	0.055
38.	-0.060	0.389	0.038	-0.165	0.101	0.159	-0.080	0.137
39.	0.320	-0.380	0.430	0.200	-0.016	-0.038	-0.032	0.162
40.	0.216	0.349	-0.100	-0.073	0.275	-0.020	0.055	0.083
41.	0.108	0.245	0.063	0.108	0.074	0.118	0.743	-0.049
42.	0.120	-0.109	0.005	0.136	-0.073	0.039	-0.045	0.004
43.	0.197	-0.135	0.171	-0.051	-0.527	-0.021	-0.107	0.315
44.	0.157	0.150	0.278	0.145	0.016	-0.107	-0.046	0.345
45.	0.095	0.229	0.314	-0.108	0.271	0.080	0.363	0.007
46.	0.044	-0.004	-0.060	0.624	0.078	0.045	-0.016	0.032

D3. Leaf Rapids respondents (continued)

Scale Number	Component 9	Component 10	Component 11	Component 12	Component 13	Component 14	Component 15
1.	0.088	-0.072	0.072	0.036	0.055	-0.188	0.166
2.	0.101	0.605	0.058	0.318	0.155	0.064	0.076
3.	0.167	0.062	0.011	-0.005	-0.249	0.082	0.194
4.	0.008	0.071	-0.043	0.024	-0.051	-0.116	0.007
5.	0.122	-0.034	0.100	-0.084	-0.176	0.052	-0.128
6.	0.043	-0.008	0.074	-0.202	0.038	-0.168	0.138
7.	0.072	-0.018	0.263	0.183	-0.130	0.126	0.006
8.	0.125	0.161	0.036	0.041	-0.059	0.087	0.809
9.	0.130	0.088	-0.334	0.024	0.258	-0.076	0.130
10.	0.031	0.269	-0.131	0.146	0.142	0.034	-0.269
11.	0.066	-0.061	0.211	0.358	0.218	0.054	0.066
12.	0.011	0.177	-0.057	0.076	0.134	-0.223	0.007
13.	0.773	0.038	-0.081	-0.052	0.144	0.093	-0.039
14.	0.088	0.078	-0.160	0.169	0.012	-0.166	-0.114
15.	0.519	0.016	-0.001	0.473	-0.010	-0.017	-0.010
16.	0.210	0.160	-0.224	0.285	0.191	0.346	0.145
17.	0.266	0.007	-0.009	-0.066	0.167	0.061	0.095
18.	0.110	0.148	-0.087	-0.100	0.083	0.138	0.072
19.	0.102	0.090	-0.166	0.145	0.101	-0.116	0.010
20.	0.169	0.024	-0.123	0.088	0.251	0.051	-0.041
21.	0.224	0.054	-0.034	0.039	0.722	-0.012	-0.110
22.	0.068	0.037	0.085	-0.049	-0.045	0.028	0.089
23.	0.264	0.254	-0.107	0.203	0.033	-0.208	-0.008
24.	0.172	0.009	0.026	0.242	0.241	0.071	-0.128
25.	0.054	0.050	0.006	0.221	0.297	0.010	-0.049
26.	0.001	0.207	-0.646	0.162	0.058	-0.111	-0.047
27.	0.510	0.047	0.201	0.037	-0.080	-0.182	-0.288
28.	0.230	0.123	0.632	0.049	-0.108	-0.211	0.142
29.	0.136	0.199	0.117	-0.040	-0.085	0.046	0.187
30.	0.103	0.010	-0.039	0.033	0.153	0.258	0.241
31.	0.019	-0.028	-0.140	0.800	-0.037	-0.008	0.017
32.	0.101	-0.147	0.067	0.082	0.197	0.027	0.174
33.	0.114	0.274	0.127	-0.290	0.015	-0.138	0.030
34.	0.035	-0.018	0.084	0.141	-0.170	0.141	-0.069
35.	0.211	0.104	-0.041	0.067	-0.062	0.005	-0.094
36.	0.008	0.688	-0.117	-0.234	-0.036	0.019	0.182
37.	0.036	0.103	-0.070	0.052	-0.010	0.150	-0.107
38.	0.121	0.418	0.503	-0.147	0.097	0.037	-0.128
39.	0.079	0.330	0.241	-0.053	0.011	0.009	0.004
40.	0.014	0.050	-0.120	-0.141	0.535	-0.285	0.109
41.	0.172	0.141	0.013	-0.049	0.098	-0.094	-0.029
42.	0.038	0.057	0.039	-0.021	-0.086	0.847	0.066
43.	0.202	0.061	0.040	0.251	0.104	0.034	0.129
44.	0.252	0.417	-0.104	0.054	-0.238	0.265	-0.399
45.	0.120	0.147	0.394	0.072	0.229	0.085	-0.111
46.	0.258	0.174	-0.068	-0.037	0.194	0.200	-0.189

D4. Respondents raised in communities with under 25,000 population

Scale Number	Component 1	Component 2	Component 3
1	0.510	0.421	-0.107
2	0.016	-0.162	0.500
3	0.477	0.371	-0.233
4	0.444	-0.448	0.102
5	0.071	0.366	0.451
6	0.463	-0.093	-0.264
7	0.544	0.192	-0.002
8	0.326	0.472	-0.003
9	0.385	0.248	0.104
10	0.206	-0.434	-0.027
11	0.551	0.373	-0.056
12	0.299	-0.014	0.370
13	0.073	-0.036	0.509
14	0.401	0.512	-0.015
15	0.480	-0.286	0.083
16	0.085	-0.417	-0.019
17	0.208	0.005	0.298
18	0.391	-0.069	0.154
19	0.490	-0.285	-0.088
20	0.654	-0.097	-0.247
21	0.276	-0.272	0.016
22	0.124	0.253	0.494
23	0.630	-0.113	0.172
24	0.443	-0.008	-0.065
25	0.628	0.047	-0.098
26	0.292	-0.439	0.320
27	0.247	-0.170	0.279
28	0.049	0.387	0.201
29	0.450	0.295	0.076
30	0.463	-0.225	-0.153
31	0.404	-0.235	0.028
32	0.082	-0.093	0.117
33	0.359	-0.151	-0.089
34	0.335	0.022	0.307
35	0.092	0.214	0.108
36	0.378	0.209	0.040
37	0.689	0.028	-0.090
38	0.011	-0.062	0.330
39	0.116	0.489	0.383
40	0.338	-0.452	0.227
41	0.497	-0.161	-0.095
42	0.381	0.348	-0.111
43	0.400	0.240	-0.323
44	0.220	0.249	0.164
45	0.536	0.100	-0.134
46	0.325	0.163	-0.125

D5. Respondents raised in communities with over 25,000 population

Scale Number	Component 1	Component 2	Component 3
1	0.041	0.082	-0.089
2	0.182	0.105	0.105
3	0.091	-0.062	-0.025
4	0.392	0.128	-0.126
5	0.094	0.012	0.083
6	0.623	-0.021	0.052
7	0.199	0.170	0.107
8	-0.001	-0.020	0.055
9	0.192	0.268	0.178
10	0.383	0.184	-0.257
11	0.127	-0.001	0.157
12	0.034	-0.010	0.047
13	0.109	0.120	-0.272
14	0.404	-0.014	0.056
15	0.296	0.227	-0.181
16	0.088	0.538	0.216
17	0.206	0.074	0.203
18	0.305	0.174	0.687
19	0.561	0.047	-0.037
20	0.810	-0.011	0.079
21	0.120	0.370	0.022
22	-0.066	-0.037	0.434
23	0.461	0.343	0.254
24	0.101	0.746	0.134
25	0.175	-0.007	0.122
26	0.282	0.213	0.032
27	-0.058	0.039	0.242
28	-0.019	0.062	0.031
29	0.056	0.035	-0.021
30	0.170	-0.034	-0.055
31	0.098	0.736	-0.038
32	0.104	0.485	0.059
33	0.199	0.228	0.087
34	0.157	-0.065	0.023
35	-0.006	0.062	0.009
36	0.080	0.110	0.358
37	0.749	0.143	0.210
38	0.101	0.041	-0.019
39	-0.064	0.075	0.615
40	0.562	0.192	-0.023
41	0.627	0.195	-0.123
42	0.009	0.005	0.033
43	-0.104	0.177	0.079
44	0.049	0.042	0.697
45	0.374	0.364	-0.086
46	0.193	0.004	0.125

D6. Respondents born in Manitoba

Scale Number	Component 1	Component 2	Component 3
1	0.183	0.727	-0.067
2	0.044	-0.027	0.157
3	-0.051	0.710	0.170
4	0.301	-0.110	0.523
5	0.016	0.038	-0.029
6	0.259	0.048	0.243
7	0.156	0.201	0.098
8	-0.065	0.315	-0.011
9	-0.009	0.051	-0.006
10	0.083	0.025	0.106
11	0.039	0.492	-0.083
12	0.155	0.009	0.110
13	-0.029	0.104	0.204
14	0.099	-0.039	0.715
15	0.427	-0.064	0.181
16	0.161	-0.127	0.226
17	0.294	0.119	0.136
18	0.123	0.039	0.071
19	0.616	0.009	0.277
20	0.391	0.214	0.268
21	0.064	0.170	0.286
22	0.101	-0.044	0.032
23	0.230	0.097	0.165
24	0.230	0.174	0.087
25	0.400	0.333	0.288
26	0.067	-0.108	0.437
27	0.016	0.036	0.187
28	-0.075	0.086	-0.079
29	0.061	0.179	0.054
30	0.030	0.277	0.610
31	0.135	0.250	0.438
32	0.027	-0.224	-0.115
33	0.143	-0.047	-0.148
34	0.281	0.236	0.189
35	0.081	-0.097	-0.217
36	-0.127	0.185	-0.060
37	0.455	0.256	0.242
38	0.011	-0.137	0.045
39	-0.018	-0.088	-0.055
40	0.138	-0.254	0.676
41	0.834	0.090	0.064
42	0.167	0.769	-0.033
43	0.093	0.630	-0.137
44	-0.001	0.149	-0.116
45	0.647	0.185	-0.067
46	0.373	0.057	-0.005

D7. Respondents born outside Manitoba

Scale Number	Component 1	Component 2	Component 3
1	0.630	-0.061	-0.010
2	-0.180	0.101	0.064
3	0.439	0.107	0.069
4	0.021	0.738	0.130
5	0.213	-0.107	0.035
6	0.404	0.279	0.360
7	0.522	0.217	0.317
8	0.307	0.066	0.008
9	0.519	0.113	0.137
10	-0.056	0.175	0.072
11	0.571	0.144	0.084
12	0.182	0.199	-0.032
13	-0.007	0.069	0.011
14	0.043	0.676	0.140
15	0.104	0.614	0.061
16	-0.150	0.096	0.045
17	0.080	0.041	0.353
18	0.038	0.049	0.809
19	0.069	0.612	0.161
20	0.416	0.274	0.459
21	-0.012	0.075	0.196
22	-0.038	-0.025	0.122
23	0.091	0.313	0.539
24	0.245	0.376	-0.005
25	0.467	0.279	0.121
26	-0.041	0.375	0.112
27	0.117	0.040	-0.030
28	0.291	-0.046	-0.160
29	0.578	-0.021	0.099
30	0.147	0.352	0.046
31	0.318	0.213	-0.018
32	0.007	0.124	0.046
33	0.210	0.159	0.067
34	0.099	0.016	0.066
35	-0.013	-0.063	0.092
36	0.2653	0.093	0.048
37	0.309	0.277	0.599
38	-0.058	0.049	0.000
39	0.114	-0.354	0.189
40	0.016	0.423	0.408
41	0.178	0.521	0.135
42	0.365	-0.037	0.111
43	0.583	-0.027	-0.178
44	-0.058	0.092	0.249
45	0.522	0.119	0.152
46	0.089	0.014	0.103

D8. Short-term residents (less than 5 years)

Scale Number	Component 1	Component 2	Component 3
1	0.770	-0.077	0.130
2	-0.051	0.059	0.151
3	0.680	0.049	0.037
4	-0.086	0.614	0.166
5	0.132	0.025	0.073
6	0.180	0.076	0.125
7	0.451	0.477	0.044
8	0.354	0.030	-0.078
9	0.432	0.291	0.093
10	-0.094	0.081	0.343
11	0.659	0.207	-0.000
12	-0.009	0.217	-0.031
13	-0.041	0.348	0.255
14	0.017	0.504	0.187
15	-0.017	0.619	0.033
16	-0.263	0.174	0.192
17	0.042	0.001	0.702
18	-0.027	-0.010	0.615
19	0.036	0.289	0.248
20	0.328	0.208	0.314
21	0.026	0.121	0.492
22	-0.056	0.077	0.108
23	0.129	0.282	0.546
24	0.263	0.490	-0.040
25	0.354	0.138	0.052
26	-0.134	0.486	0.486
27	0.100	0.356	0.089
28	0.300	-0.160	-0.174
29	0.608	0.127	-0.038
30	0.159	0.345	0.026
31	0.166	0.697	0.150
32	-0.249	0.224	0.150
33	0.200	0.085	0.149
34	0.154	0.055	0.028
35	-0.127	-0.029	-0.095
36	0.229	0.058	0.098
37	0.406	0.283	0.641
38	-0.107	0.190	0.133
39	0.093	-0.136	0.135
40	-0.067	0.347	0.547
41	0.034	0.008	0.209
42	0.627	-0.015	-0.040
43	0.589	-0.032	-0.035
44	0.067	0.018	0.002
45	0.136	0.115	0.065
46	0.432	0.047	0.173

D9. Long-term residents (5 years or more)

Scale Number	Component 1	Component 2
1	0.477	-0.416
2	-0.030	0.295
3	0.501	-0.309
4	0.389	0.428
5	0.186	-0.248
6	0.471	0.114
7	0.504	-0.238
8	0.304	-0.474
9	0.339	-0.199
10	0.195	0.462
11	0.487	-0.394
12	0.365	-0.032
13	0.050	0.062
14	0.329	0.501
15	0.436	0.265
16	0.045	0.450
17	0.179	-0.012
18	0.433	0.005
19	0.461	0.297
20	0.637	0.131
21	0.279	0.282
22	0.205	-0.275
23	0.582	0.166
24	0.457	0.014
25	0.600	-0.065
26	0.286	0.430
27	0.144	0.101
28	0.084	-0.277
29	0.350	-0.208
30	0.340	0.248
31	0.355	0.265
32	0.116	0.175
33	0.388	0.155
34	0.370	-0.047
35	0.221	-0.191
36	0.377	-0.192
37	0.693	0.052
38	0.011	0.101
39	0.236	-0.411
40	0.336	0.408
41	0.617	0.167
42	0.316	-0.295
43	0.324	-0.227
44	0.332	-0.294
45	0.578	-0.104
46	0.349	-0.075

D10. Male respondents

Scale Number	Component 1	Component 2	Component 3
1	0.650	-0.002	0.209
2	-0.133	-0.083	0.049
3	0.635	0.038	0.140
4	-0.011	0.295	0.140
5	0.299	-0.010	-0.016
6	0.199	0.020	0.633
7	0.280	0.198	0.298
8	0.173	-0.072	0.131
9	0.338	0.089	0.252
10	-0.000	-0.085	0.369
11	0.449	0.282	0.079
12	0.104	0.067	0.033
13	0.104	0.064	-0.132
14	0.038	0.104	0.136
15	0.102	0.603	0.150
16	-0.159	0.024	0.122
17	0.079	0.098	0.101
18	-0.191	0.096	0.647
19	-0.086	0.588	0.342
20	0.317	0.274	0.696
21	0.100	0.088	0.140
22	-0.138	0.030	-0.013
23	-0.004	0.396	0.421
24	0.176	0.434	0.137
25	-0.328	0.190	0.273
26	-0.086	0.083	0.130
27	0.246	-0.080	-0.187
28	0.143	0.059	-0.129
29	0.259	0.223	0.146
30	0.236	0.164	0.021
31	0.441	0.261	-0.079
32	-0.093	0.114	0.001
33	0.045	0.162	0.244
34	0.253	0.312	-0.087
35	-0.011	0.037	-0.029
36	0.125	0.107	0.065
37	0.269	0.452	0.623
38	-0.102	0.053	-0.056
39	0.062	0.026	-0.023
40	-0.183	0.159	0.274
41	-0.064	0.750	0.138
42	0.522	-0.013	0.073
43	0.600	-0.158	0.018
44	0.138	0.061	0.094
45	0.260	0.582	0.035
46	0.256	0.414	0.106

D11. Female respondents

Scale Number	Component 1	Component 2	Component 3
1	0.676	-0.043	0.026
2	-0.090	-0.037	-0 014
3	0 581	0.043	0.119
4	-0.037	0.702	0.160
5	0.055	-0 074	-0.128
6	0.223	0.278	0.531
7	0.478	0.153	0.240
8	0.382	0.095	-0.091
9	0.096	-0.021	0.313
10	-0.024	-0.178	0.037
11	0.577	-0.070	0.105
12	0.038	0.104	0.133
13	0.035	0.208	-0.081
14	-0.010	0 777	0.150
15	0.111	0.653	0.105
16	-0.235	0.012	0.199
17	0.065	0.053	0.423
18	-0.023	0.114	0.612
19	-0.165	0.379	0.210
20	0.267	0.218	0.666
21	-0.081	0.067	0.355
22	-0.119	-0.033	-0.129
23	-0.170	0.235	0.412
24	0.218	0.199	0.040
25	-0.535	0.181	0.390
26	-0.122	0.323	0.120
27	0.066	-0.009	-0.142
28	0.087	-0.084	-0.033
29	0.353	0.048	-0.333
30	0.138	0.516	0.143
31	0.138	0.148	-0.097
32	-0.049	0.066	-0.052
33	0.094	0.065	0.081
34	0.120	0.023	0.010
35	-0.120	0.023	-0.010
36	-0.046	-0.024	0.012
37	0.272	0.056	0.037
38	-0.228	0.290	-0.510
39	-0.115	0.090	-0.024
40	-0.077	-0.347	0.233
41	-0.257	0.362	0.317
42	0.516	-0.155	0.030
43	0.704	-0.056	-0.080
44	0.065	0.099	0.040
45	0.549	0.054	0.284
46	0.186	0.077	0.180

D12. Single respondents

Scale Number	Component 1	Component 2	Component 3	Component 4
1	0.159	0.576	-0.103	0.143
2	-0.140	-0.011	0.032	-0.164
3	-0.054	0.597	0.227	0.106
4	0.641	-0.146	0.162	0.238
5	-0.069	-0.227	0.362	0.041
6	0.070	0.091	0.084	0.770
7	0.095	0.032	0.080	0.412
8	-0.111	0.136	-0.081	0.227
9	0.021	0.103	0.324	0.099
10	0.137	0.001	0.135	0.080
11	0.019	0.248	0.031	0.263
12	-0.119	-0.027	-0.091	0.115
13	0.294	0.055	0.361	-0.175
14	0.434	-0.119	0.230	0.322
15	0.244	-0.056	0.059	0.191
16	0 185	-0.082	0.056	0.134
17	0.005	0.054	0.779	0.151
18	0.163	0.239	0.354	0.278
19	0.621	0 078	0.216	-0.022
20	0.286	0.324	0.258	0.637
21	0.318	0.211	0.167	-0.004
22	0.106	0.112	0.159	-0 171
23	0.408	0.198	0.589	0.040
24	0 356	-0.094	-0.019	0.024
25	0.262	0.169	-0.019	0.586
26	-0.002	-0.084	0.297	0.218
27	0.070	0.017	-0.052	0.188
28	-0.020	-0.004	0.016	-0.063
29	0.082	0.284	0.007	-0.166
30	0.278	0.016	-0.072	0.169
31	0.382	0.149	0.033	0.176
32	-0.006	-0.073	0.098	-0.123
33	0.135	0.264	0.066	0.014
34	0.041	-0.028	-0.013	0.089
35	0.110	-0.075	-0.100	-0.112
36	-0.125	0.072	0.226	0.046
37	0.393	0.382	0.418	0.266
38	0.053	-0.145	-0.123	-0.048
39	-0.128	0.078	-0.015	0.131
40	0.293	-0.178	0.439	0.087
41	0.740	0 085	0.088	0.008
42	-0.031	0.756	0.155	0.108
43	0.039	0.533	-0.387	0.240
44	-0.066	0.216	-0.337	0.199
45	0.725	0.059	-0.172	0.339
46	0.087	0.618	-0.053	0.105

D13. Married respondents

Scale Number	Component 1	Component 2	Component 3
1	-0.061	0.149	0.745
2	0.137	-0.002	-0.228
3	0.140	0.072	0.634
4	0.718	0.167	0.005
5	-0.127	0.006	0.327
6	0.223	0.665	0.112
7	0.189	0.441	0.238
8	0.134	0.008	0.215
9	0.127	0.225	0.485
10	0.250	0.122	0.146
11	0.014	0.215	0.432
12	0 162	0.144	0.025
13	0.164	-0.111	-0.003
14	0 749	0.085	0.049
15	0.574	0.129	0.011
16	0.061	-0.003	-0.161
17	0.049	0.066	0.120
18	0.080	0.525	-0.213
19	0.379	0.262	-0.063
20	0.227	0.684	0.126
21	0 093	0.129	-0.011
22	0.062	-0.106	0.086
23	0.378	0 293	0.064
24	0.315	0.070	0.140
25	0.271	0.439	0.297
26	0.458	-0.009	-0.083
27	0.080	0.097	0.011
28	-0.065	-0 054	0.134
29	-0.032	0.448	0.145
30	0.550	0.164	0.064
31	0.348	-0.042	0.355
32	0.136	-0.038	-0 059
33	0 031	0.159	0.077
34	-0.002	0.037	0.120
35	-0.086	0.026	0.006
36	0.173	-0.008	0.351
37	0.347	0.522	0.179
38	0.140	-0.023	-0.053
39	-0.201	0.089	0.095
40	0.570	0.256	-0.046
41	0.281	0.283	0.069
42	-0.022	0.127	0.202
43	-0.116	0.227	0.473
44	0 052	0.105	0.008
45	-0.030	0.397	0.212
46	0.058	0.051	0.177

Appendix E

THE JOINT EUCLIDEAN MODEL

The model used in the multidimensional scaling procedure is:

$$o_{ij} \cong t_i[d_{ij}]$$

$$d_{ij} = \sqrt{\sum_{a}^{r} (x_{ia} - y_{ja})^2}$$

where:

o_{ij} = the rating of object i on attributes j

d_{ij} = the distance between object i and attribute j

x_{ia} = the coordinate of the i'th object on a'th dimension

y_{ja} = coordinate of j'th attribute on a'th dimension

r = the number of dimensions

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