

A SOCIOECONOMIC ANALYSIS OF HOUSING NEED:
LONE PARENT FAMILIES IN WINNIPEG, 1981-1991

A Thesis Submitted to
the Faculty of Graduate Studies
in Partial Fulfilment of
the Requirements for the Degree of

MASTER OF ARTS

BY

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TABLE OF CONTENTS

LIST OF FIGURES	iii
LIST OF TABLES	iv
LIST OF EQUATIONS	v
ABSTRACT	vi
ACKNOWLEDGEMENTS	vii
CHAPTER ONE:	
INTRODUCTION	1
1.1 STATEMENT OF THE PROBLEM	1
1.2 PURPOSE AND OBJECTIVE OF STUDY	4
1.3 METHODOLOGY AND ORGANISATION OF STUDY	8
1.4 SIGNIFICANCE OF THE STUDY	12
CHAPTER TWO:	
THEORETICAL PERSPECTIVES OF HOUSING NEEDS FOR THE LONE PARENT FAMILY	15
2.1 INTRODUCTION	15
2.2 OVERVIEW OF EXISTING LITERATURE	18
The Lone Parent Family	19
Housing Need	29
Housing Adequacy	31
Housing Affordability	33
Housing Suitability	34
The Core Housing Need Model	36
2.3 THEORETICAL EXPLANATIONS OF HOUSING NEED	41
Dependent Variable	42
Independent Variables	48
Socioeconomic Status	51
Education	57
Income	57
Occupation	63
Gender	64
Age	69
2.4 STATEMENT OF HYPOTHESIS	72
Heuristic Model of Housing Need	74
Research Hypotheses	76
CHAPTER THREE:	
METHODOLOGY IN THE STUDY OF HOUSING NEED FOR THE LONE PARENT FAMILY	79
3.1 INTRODUCTION	79
3.2 POPULATION OF STUDY: WINNIPEG HOUSEHOLDS	81
3.3 SAMPLE SELECTION: THE WINNIPEG AREA STUDY, 1981-1991	85

3.4	MEASUREMENT OF THE DEPENDENT AND INDEPENDENT VARIABLES	97
	Dependent Variables	98
	Independent Variables	116
3.5	METHOD OF DATA ANALYSES	153
CHAPTER FOUR:		
	EMPIRICAL ANALYSES	159
4.1	INTRODUCTION	159
4.2	LONE PARENT HOUSING NEEDS FOR MEN AND WOMEN	161
4.3	DETERMINATION OF LONE PARENT HOUSING NEEDS	170
	The Analysis of Variance: Measurement Assumptions	173
	Preliminary Analysis of Variance: Lone Parent Housing Needs	177
	Secondary Analysis of Variance: Lone Parent Housing Needs	180
	The Analysis of Covariance: Measurement Assumptions	185
	The Analysis of Covariance: Lone Parent Housing Needs	187
CHAPTER FIVE:		
	SUMMARY OF FINDINGS AND DISCUSSION	192
5.1	DISCUSSION OF SIGNIFICANT FINDINGS	194
5.2	POLICY IMPLICATIONS OF THE FINDINGS	199
5.3	RESEARCH IMPLICATIONS OF THE FINDINGS	203
5.4	CONCLUDING REMARKS	205
	BIBLIOGRAPHY	207
APPENDIX I:		
	CONCATENATED WINNIPEG AREA STUDY FINAL SAMPLE CODE WITH DICTIONARY	215
APPENDIX II:		
	SELECTED VARIABLE FREQUENCIES: CONCATENATED WINNIPEG AREA STUDY CODEBOOK, 1981-1991	230
APPENDIX III:		
	SELECTED VARIABLE TABULATIONS: CONCATENATED WINNIPEG AREA STUDY, 1981-1991	239

LIST OF FIGURES

Core Housing Need Model	43
The Measurement of Housing Suitability	47
The Measurement of Housing Affordability	49
Socioeconomic Analysis of Housing Need for Lone Parent Families	73
Heuristic Model of Variables Related to Housing Need .	75
Preliminary Assessment of Lone Parent Housing Needs .	178
Secondary Assessment of Lone Parent Housing Needs . .	182
Tertiary Assessment of Lone Parent Housing Needs . .	188

LIST OF TABLES

Selected Family Types and Children Below the Low Income Cut-Off, 1991	61
Average Canadian Household Income by Family Types, 1981- 1991: (in constant 1986 dollars)	63
Canadian and Manitoban Family Types by Number of Children, 1991	65
Canadian Lone Parent Families by Gender, Labour Force Participation, and Age: 1991	70
Winnipeg Area Study: Successful Interviews by Contact Attempt, 1981-1991	90
Winnipeg Area Study: Completed Interviews, 1981-1991 .	91
Winnipeg Area Study: Distribution of Family Types, 1981- 1991	95
Winnipeg Area Study: Family Types by Children, 1981- 1991	104
Winnipeg Area Study: Housing Suitability by Family Types, 1981-1991	111
Winnipeg Area Study: Housing Suitability Grouped by Family Types, 1981-1991	115
Winnipeg Area Study: Respondent Educational Level, 1981- 1991	123
Family Type by Educational Level Winnipeg, Manitoba, and Canada, 1991	124
Canadian Consumer Price Index, 1981-1991: Base 1986 Constant	132
Winnipeg Area Study: Occupational Category of Respondent by Family Type, 1981-1991	144
Winnipeg Area Study: Respondent Primary Activity by Family Type, 1981-1991	147
Winnipeg Area Study: Respondent Gender by Family Type, 1981-1991	149
Winnipeg Area Study: Lone Parent Housing Suitability by Gender, 1981-1991	168

Preliminary Analysis of Variance: Lone Parent Housing Suitability by Factors	179
Secondary Analysis of Variance: Lone Parent Housing Suitability by Factors	184
Analysis of Covariance: Lone Parent Housing Suitability by Housing Affordability Factors	190

LIST OF EQUATIONS

Determination of Housing Suitability	108
Determination of Housing Suitability Measures	110
Determination of Interval Income Values	131
Final Determination of Income Values	134
Hypothesis of Different Means: Men and Women Lone Parents	161
Hypothesis Test Statistic: Two Sample t -test	162
Probability of Correctly Rejecting a Hypothesis	166
Hypothesis of Different Factor Means: Men and Women Lone Parents	174
Analysis of Variance: F-Statistic	175

ABSTRACT

This study will establish the parameters for an investigative focus towards discerning the socioeconomic variables underlying the housing conditions Canadians lone parent families face everyday within Winnipeg. In particular, a quantitative investigation into the lives of lone parents families reveals a number of interesting socioeconomic variables which have been insufficiently addressed in past governmental and pedagogic research. The research is conducted through 1981 to 1991 utilising data from the Winnipeg Area Study surveys of families in the urban area of Winnipeg.

This study has delineated a method of analysis which underscores the relative importance variables pertaining to the understanding of the housing needs have for the lone parent family housing needs. In particular, the variables of housing affordability including education, occupation, income, age and gender form a substantive basis for an empirical measure of housing needs for the lone parent family through the analysis of covariance method. As well, empirical measures of housing needs for lone parent families within Winnipeg are introduced to facilitate the measurement. The analysis includes a means to evaluate housing suitability through an indexed measure based on empirical data. Included within the analyses are twenty tables and computer code generated for the Winnipeg Area Study.

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CHAPTER ONE:
INTRODUCTION

1.1 STATEMENT OF THE PROBLEM

Lone parent families, while sharing similarities with other Canadian households comprised of children, have generally encountered difficulties obtaining housing that is both affordable and suitable. As recognised within Canadian housing objectives and in the policies and programs of the Canadian Mortgage and Housing Corporation, there are three dimensions of housing needs assessment. The three dimensions include affordability, adequacy, and suitability. Yet, due to the limitations of utilising the Winnipeg Area Study survey, this study will be concerned with the measurement of only the dimensions encompassing the concepts of housing affordability and suitability.

A literature review of housing in Canada clearly demonstrates that a considerable percentage of lone parent families have faced economic constraints in their choice of affordable and suitable shelter. In actuality, research over the last few decades has demonstrated that a majority of lone parent families have lived at or below the established income poverty levels in Canada and, overwhelmingly, these households are headed by a lone parent woman (Hudson and Galaway, 1993).

Significant research has also indicated that a woman lone parent is much more likely to face economic impediment than either her male counterpart or two parent households primarily due to differences in family income. Yet, these findings have resulted in public policies directed to the amelioration of the income differentials without sufficiently considering other predictors of the barriers lone parent families face in obtaining affordable and suitable housing. Combined with the rapid and disproportionate growth of the lone parent family in Canada, public policy efforts have been substantially constrained in ensuring the availability of affordable and suitable housing for lone parent households headed by women (Morissette, 1987: 7; Hudson and Galaway, 1993: 335; McKie, 1993: 53-54). As Fran Klodawsky and her associates have succinctly noted, the common research finding of widespread housing problems among lone parent families would suggest that income alone may be an insufficient explanatory variable in the larger housing needs equation (Klodawsky, Spector and Rose, 1985: 2). Therefore, the explanation of lone parent housing affordability and suitability deficiencies needs to evolve beyond analysis of the relative impoverished living conditions of lone parent families and become attributed to the specific socioeconomic variables which directly affect the lives of lone parent families.

With the changing governmental role in both housing and social welfare programs, an impending economic and social

crisis for the lone parent household will be likely realised in the near future without a more systematic understanding of housing needs for subsequent public policy development. Although the inferences made within the current pedagogic literature may be quite accurate in the assessment of income differentials between family types, there is insufficient systematic inquiry for variables other than family income as predictors of housing needs for the lone parent family. To further understanding of the housing accommodations lone parent families reside within, it is necessary to determine why and how certain variables, along with family income, relate to the achieving of affordable and suitable housing for the lone parent family. The following examination into the problems of housing affordability and suitability will attempt to determine which distinctive needs and restrictions in shelter choices lone parent families are faced with beyond simply their income limitations.

1.2 PURPOSE AND OBJECTIVE OF STUDY

The purpose of the current study is to determine the extent to which certain socioeconomic variables affect housing affordability and suitability for the lone parent family. The foremost postulate for this study is that the current public policy, under the Canada Mortgage and Housing Corporation's Core Housing Need Model (also known as the Core Need Model), has not adequately ascertained nor addressed the socioeconomic variables which significantly impede the lone parent family from obtaining affordable and suitable housing. As well, this study shall endeavour towards a greater understanding of how income, gender, socioeconomic status, household composition, and dwelling type serve to create and maintain the perpetuation of poverty and inadequate housing conditions in which lone parent families must endure.

The study shall have the preceding purposes and can be defined in its scope by the following list of objectives and goals:

- a). to review lone parent housing affordability and suitability research and establish some of the more prevalent theoretical assumptions and arguments which characterise these phenomenon;
- b). to assess the current research on the lone parent family and demonstrate the importance of

continued research within and beyond the present study;

c). to examine the historical and current demographic, socioeconomic, and housing needs characteristics of the lone parent family in Canada;

d). to determine how housing affordability and suitability specifically effects the lone parent family in Winnipeg as evidenced from the Winnipeg Area Study data set to be utilised within the current study;

e). to critically evaluate the relationship of income, gender, socioeconomic status, household composition, and age in terms of the impact each socioeconomic variable has upon housing affordability and suitability for the lone parent household, and;

f). to recommend an improved and modified analytical technique of housing needs determination to the Core Housing Need Model which may improve the effectiveness of public policy to provide more

affordable and suitable housing for the lone parent family.

With respect to the conceptual relationships between explanatory variables, significant attention will be extended to the primary socioeconomic variables of poverty which affect the lone parent family. Variables unique to the explanation of housing conditions for lone parent families will be assessed in terms of their explanatory strength as causative indicators of housing affordability and their level of impediment to achieving suitable housing. The relationship between the socioeconomic variables may be corrected or mitigated through public policy to improve upon the housing conditions of the lone parent family. More explicitly, this study will empirically test the hypothesis that there is a direct relationship between the socioeconomic characteristics of the lone parent and their housing condition.

Central to this hypothesis is the assumption that the ability of individuals to satisfy their housing needs is a direct function of specific socioeconomic variables including income, gender, socioeconomic status, household composition, and age. The following empirical analysis will provide evidence that lone parent families experience the highest rate of poverty for any family type. As well, the investigation will demonstrate that lone parent families have the highest

incidence of housing affordability and suitability problems when compared to other household types.

The ensuing analysis of lone parent families should demonstrate clear and significant differences in family income between men and women headed lone parent families. Both individual and external variables will be utilised to account for this variance. Based on the survey and data collection of the Winnipeg Area Study from 1981 to 1991 inclusively, combined with an examination of the Canadian census data from the same period, a hypothesis test will determine if income, gender, socioeconomic status, household composition, and age are each strong determinants and predictors of housing affordability and suitability for the lone parent family. Finally, the predicative ability of each socioeconomic variable will be considered to demonstrate the relationship each has upon the lone parent family achieving affordable and suitable housing.

1.3 METHODOLOGY AND ORGANISATION OF STUDY

The current study cannot claim to examine all the facets pertaining to the problems and constraints lone parent families must undergo. Rather, emphasis will be on the question of housing affordability and suitability for the lone parent family type. The current examination shall be facilitated through a theoretical literature review of the changes in lone parent housing and the lone parent family, a comprehensive demographic characterisation based on the 1991 Canadian census data and annually collected national data, and through an analysis of the socioeconomic variables directly related to housing affordability and suitability. The current study will examine survey samples of households conducted by the Winnipeg Area Study within the urban area of Winnipeg between the years 1981 to 1991 inclusively.

Chapter two will proceed with a review of the substantive literature pertinent to the housing conditions of the lone parent family. This shall include a discussion of the appropriate issues and theoretical frameworks surrounding the concepts of housing affordability and suitability. As well, chapter two will include a substantial review of the prominent literature and theoretical frameworks which will preclude the introduction of a causal model for analysis. Moreover, the review of literature will provide a basis for the delineation of the substantive variables which will be employed within the causal model for analysis. Furthermore, chapter two will be

devoted to specifying the theoretically based problems and effects of utilising certain variables in the measurement of inadequate housing conditions for the lone parent family. Finally, the formal postulates of the hypotheses will be presented and evaluated in terms of their methodological and theoretical contribution to the study. With this, a heuristic model will be presented which specifies the directional relationships postulated between the socioeconomic variables articulated within the hypotheses.

Chapter three, following the review of the appropriate literature and theoretical frameworks, shall be devoted to discussion of the measurement and methodology for the present study. The methodological discussion will include the presentation of a systematic method of analysis to test the relative acceptability of housing suitability for the lone parent family. This will include an explanation of the method chosen, a discussion of the sample size and data set, and indications as to the validity and reliability of the causal model. Furthermore, each of the independent and dependent variables will be examined from the Winnipeg Area Study survey years with respect to sampling and distributional properties. As well, the investigation within chapter three will provide both a descriptive and inferential assessment of the study sample and include national patterns and statistics evident from the 1991 census data and supplemented by Statistics Canada data from 1981 to 1991. Finally, the appropriateness

of the methods utilised for analysis shall be addressed with respect to both pedagogic contribution and future replication and, in fact, the intersubjectivity of the study.

Chapter four constitutes the empirical investigation and analysis for the current study. A number of analyses will be undertaken to determine the extent of causation espoused within the literature review, causal model, and formal hypotheses found within chapter two. Three specific measures of housing needs will be introduced to measure the empirical relationship between the variables delineated within chapter three. Included in this assessment, the variance and covariance of the empirical findings will be accordingly taken to determine the strength of the explanatory model presented within chapter three.

Finally, chapter five will conclude this study with a critical evaluation of the analyses of chapter four, a discussion of the revealed relationships between socioeconomic variables, and a synthesis of the findings for future research. The implications of the theoretical analysis for both Winnipeg and Canada will be assessed. As well, a summary of the findings on the demographic and housing characteristics of the lone parent family will be presented. This will allow for a systematic evaluation of the applicability of utilising the causal model for both further replication and as a means to determine future housing needs of the lone parent family. Moreover, a discussion of the results and findings, both

hypothesized and unexpected, will follow the analysis. Finally, the policy implications of the current study will be discussed and evaluated in light of possible future research.

1.4 SIGNIFICANCE OF THE STUDY

Pedagogic studies and research previously conducted have not sufficiently investigated the underlying variables related to the affordability and suitability of housing for the lone parent family with satisfactory analytical precision. Although gender and income are the variables which have often been included in studies of housing need for the lone parent family, simply identifying and assessing the extent of income differentials between family types is as far as most analyses advance. As a result of this continuing inability to formulate a comprehensive causal model for analysis, housing conditions of the lone parent family will be measured by utilising the two constructs of housing affordability and suitability as the defining dimensions of housing need. As noted above and further discussed below, housing adequacy is beyond the scope of the current study. The main contribution this study shall make to research on housing needs for the lone parent family is to bring forth a new level of multivariate analysis for the examination of housing affordability and suitability.

Given the considerable emphasis of past studies which have been focused on gender differences and income differentials in the affordability and suitability of lone parent family housing, it remains distressing that considerable multivariate analyses have yet to be conducted. Generally, previous studies have not isolated the

interrelationships within and between the intervening processes of causality for the dimensions of affordability and suitability with either the use of either multiple regression or analyses of variance techniques. The differing effect of these variables on women and men have not been adequately evaluated to determine the significance of the dimensionality as they relate to housing needs for these two distinct groups of lone parent families. As a result, it is essential that such multivariate analyses be conducted on the housing needs of the lone parent family. The result would be a more complete understanding of the relationship each of the socioeconomic variables play upon the creation of inequality between the various types of household compositions.

As well, a more complete understanding will be acquired of the intervening processes which lead to the differences in housing needs between men and women. By comprehending the explanatory strength of the underlying variables, it may be possible to develop more effective public policy to prevent, or at least ameliorate, the current trend towards poverty exhibited within Canada. Furthermore, sociologists, geographers, urban planners, and other family studies scholars, many of whom have been concerned with the barriers to both affordable and suitable housing for the lone parent family, may be inclined to utilise the results of the present study to further evaluative knowledge and ultimately alleviate these inequalities. Although the information from this study

may supplement other theories and studies, it will provide these researchers with specific information which may help them both theoretically and substantively in their efforts to diminish the negative consequences which result from inadequate housing for the lone parent family.

Although the majority of quantitative research concerning the lone parent family has been conducted at the national level, there is still need to compare specific study areas with national trends and analyses. It is likely that no such study has been undertaken in either Winnipeg or conducted in Canada. As a result, it is important to further the base of knowledge and facilitate the replication of research conducted on the lone parent family to ensure that the findings of previous studies are also true of Canada and Winnipeg.

The current investigation endeavours to contribute to a more thorough exploration and understanding of the relationship between socioeconomic variables which directly affect the housing need for the lone parent family. In essence, the analysis of the present study will allow for a more systematic understanding of differences in lone parent family experiences of the barriers to housing affordability and suitability than previously offered.

CHAPTER TWO:
THEORETICAL PERSPECTIVES OF HOUSING NEEDS FOR
THE LONE PARENT FAMILY

2.1 INTRODUCTION

In the most basic sense, there are archetypal and commonsense socioeconomic variables underlying the housing needs of the lone parent family. A review of the literature repeatedly demonstrates that the foremost direct explanatory socioeconomic variable of housing affordability and suitability for the lone parent family is the variable of family income. Many other variables act as tangible barriers for the lone parent family to obtaining affordable and suitable housing. As such, the lone parent family must strive to avoid the conditions of poverty which lead to and derive from such circumstances as inadequate child-care, lack of education opportunities, insufficient child-support, and reduced employment possibilities (Klodawsky, Spector, and Hendrix, 1983; Clark, 1993; Dooley, 1993; Lero and Brockman, 1993). Moreover, there are structural and systemic inequalities within legislative acts, public policy, and mortgage lending policies which indirectly, or directly, impede the lone parent family from achieving affordable and suitable housing. For example, the *Income Tax Act*, *The Divorce Act*, legal jurisprudence, economic policies, workplace

policies, child poverty directives, and social welfare policies have each been shown to undermine the ability of the lone parent family to obtaining both affordable and suitable housing (Frank, 1987: 158; Clare and Glossop, 1993: 216-217; Eichler, 1993: 147-148; McDaniel, 1993; Pask, 1993: 185; Zweibel, 1993: 157-164). Yet, each of these conditions and structural inequalities have not affected every lone parent family in a similar manner. Therefore, it is proposed that the primary underlying socioeconomic variables directly affecting housing needs can be succinctly addressed within an adequate analysis of housing affordability and suitability for the lone parent family.

The purpose of this chapter is to review the substantive literature and theoretical arguments appropriate in a discussion of affordable and suitable housing conditions for the lone parent family. The chapter is organised into three distinct sections. The first section is an overview of the literature which considers the definitions and characteristics of measuring housing need for the lone parent family. The second part is a review and development of the substantive theoretical and conceptual framework for the analysis within the current study. Finally, the third section will be comprised of the theoretical delineation of the substantive variables to be measured for the causal model of analysis. Overall, this chapter will be devoted to specifying and defining the problems and effects of utilising certain

variables in the measurement of inadequate housing conditions for the lone parent family.

2.2 OVERVIEW OF EXISTING LITERATURE

This section will attempt to organise and synthesize the numerous investigations and arguments of housing needs for the lone parent family in Canada. Much of the previous work undertaken on assessing the housing needs of lone parent families invariably identifies income as the primary problem which the majority of lone parent families face when trying to find affordable and suitable housing. Typically, the discussion which emerges from this argument focuses upon various substantive issues rather than addressing issues surrounding the influence other socioeconomic variables have upon the attainment of suitable housing. Yet, each of these substantive issues are in actuality constructs and proxy indicators of the underlying socioeconomic variables endemic to housing need for the lone parent family. Furthermore, the implications for public policy of such contentions are varied in the response mechanisms proposed to alleviate the housing needs of lone parent families.

The various concepts and constructs discussed thus far are admittedly very diverse in their meaning. Yet, this diversity is indicative of the manner in which housing for the lone parent family has been examined within the Canadian context. This section shall organise the basis for a proposed framework of housing needs analysis. First, concepts surrounding housing needs will be systematically defined and reviewed. Second, the current explanations given for lone

parent family housing needs within the literature will be espoused and discussed in terms of their theoretical strengths. Finally, the resulting theoretical review of housing needs will culminate into a series of hypotheses which will be presented and evaluated in light of the preceding discussions. Additionally, a heuristic model from which the hypothesized relationships can be conceptually perceived will be presented to facilitate the empirical analysis.

The Lone Parent Family

In this study, the family or household type refers to the effective unit of material consumption for shelter and housing services, describing the collection of people who occupy a single dwelling. There are five major household types according to Statistics Canada. These include the conjugal man and woman (legal marriage or common-law relationship) without children, conjugal man and woman with children, families which are considered non-families, multiple and extended families, and lone parent families. Based on the Statistics Canada definition, the lone parent family will be defined for the current investigation as a household where an individual parent is the primary household maintainer and the solitary adult responsible for child rearing. As a result, cohabiting adults, exclusive of children residing with a parent, are excluded from the parameters of a lone parent

family for this study. Cohabitation is an arrangement which may not be identified by a lone parent due to a number of possible reasons. Ultimately, this facet of family identification can create methodological problems when using data from self reported survey information. Yet, chapter three will strive to define the parameters for which an effective measure for housing needs of lone parent family can be obtained.

The lone parent family is a concept which can be defined by a number of terms. The term lone parent family has been chosen for the current study due to the connotations and semantics associated with other terms. For example, the term single parent family has the notion that the parent is no longer married. As is evident in the work of Seelig and Seelig (1995: 211) for the C.D. Howe Institute, assumptions and premises of conjugal relationships existing *a priori* to child birth remain commonplace in the literature. Although a conjugal relationship may apply to previous relationships for a number of lone parent families, a good proportion have not been coupled nor intend to do so (Eichler, 1993).

More recently, a 1995 study commissioned by the Canada Mortgage and Housing Corporation and the Canadian Home Builders' Association is evidence of the research implications which the assumption of a *a priori* conjugal relationships create. Environics Research Group Limited (1995) was commissioned to investigate the future housing preferences of

all Canadian households. Yet, the conclusions of Environics Research Group did not mention anywhere in the final report either the housing needs or the future preferences of lone parent families within Canada. The Environics Research Group simply either ignored this significant group of households or was negligent in their sampling methods. This is of particular importance when one considers the nature of the questions pertaining to the future aspirations of housing for the families (questions based on a two parent family composition) and the implications for public policy. In fact, it is quite remarkable that a 1995 governmentally funded study would predict the preferences for housing through a stratified sampling procedure without considering the demographic distribution of household types and formations in Canada. Yet, research of the type undertaken by Environics Research Group can be characterised as typical within the private research sector.¹

Susan A. McDaniel (1993: 205) has summarised the individual and societal implications of utilising the term single parent family quite appropriately and accurately in the following:

Single parenthood [...] has been seen as a problem to society for some time. Single parenthood at the individual level is something to be avoided. It is

¹A critique of the theoretical and methodological considerations of the Environics Research Group Limited study would, by far, require too much attention--more than that which is available in the current study.

seen as punishment for sin, a sign of moral character weakness, an indication of women's independence (seen as a negative attribute in this instance), or perhaps insufficient willingness to try to make marriages and relationships work. At the societal level, single parenthood is taken as an indicator of society in trouble, possibly dangerous for children (lack of male role models arguments), a reflection of gender roles changing (not necessarily for the better), and a drain on the public purse.

Obviously, the above statement reflects the views of some portions of society and not the whole. Yet, the connotations derived from the usage of the term single parent serves to perpetuate those views.

In order to address the definitional aspects of the lone parent family, Eichler (1993: 139-140) has systematically identified the existence of both simple and complex lone parent families in a typology of family types. Eichler (1993) argued that lone parent families can come into existence through four ways whereas two parent families only result from two different causes.² Two parent families result from either:

- a). a conjugal relationship (legal marriage or common-law relationship) resulting in a child birth or an adoption, or;

²Eichler (1993: 140) initially identified five specific scenarios in the creation of a lone parent family. The two scenarios of marriage dissolution and common-law union dissolution have been collapsed into a single category in this study for the benefit of a more parsimonious typology.

b). a lone parent commencing a conjugal relationship with another adult (who may also bring children into the relationship).

Whereas, lone parent families can result from either simple lone parent family (c and d) or complex lone parent family (e and f) formation due to:

c). the result of a death of either conjugal partner in a family with children;

d). the adoption of child or children by either a man or woman outside of a conjugal relationship;

e). the result of a separation or divorce of a married couple or common-law relationship, or;

f). the birth of a child to a woman neither in a conjugal relationship nor cohabiting with the father.

Although Eichler's typology of family types reflects the data collected by Statistics Canada in the past, the realisation of increasing common-law relationships and the subsequent increase in their dissolution rates, has resulted in Statistics Canada discontinuing the collection of data on

conjugal relationships. The results of which will be to make national statistical analyses more difficult when differentiating between family types. As well, the various family types have very specific and divergent housing needs which are addressed through the formation of public policy. Although the result of this discontinuance may cause some concern for researchers, the continued differentiation between family types can be achieved through other means.

The substantive differences between the lone parent family and other family types must be acknowledged and recognised in the evaluation of housing need. The lone parent is the exclusive individual in the family responsible for household maintenance, the rearing of the children, and is usually the only source of income for the family. In fact, with only a solitary adult caring for the family, lone parent families with preschool children normally require a dominant commitment from the lone parent to the time consuming and strenuous task of child rearing (Wiesenthal, Weizman, and Mockler, 1991). Yet, there are substantial qualitative differences between lone parent families and other family types due to extended familial relations and other various support services (Klodawsky, Spector, and Rose, 1985: 2-2; Gee, 1995). Unfortunately, the measurement of the degree to which extended familial relations and various support services affect the ability of the lone parent family to meet their housing affordability and suitability needs is beyond the

scope of the current investigation. Further qualitative research is required to determine the magnitude of such support networks and the effect they have on housing needs of the lone parent family.

As well as the qualitative differences between families based on support networks, there exist other significant differences between the lone parent family and other family types. A second distinction to be considered is that the lone parent family differs from other family types in terms of governmental response to their social and economic needs. This becomes apparent from the recognition by both the Federal and provincial governments of the social and economic needs of the lone parent family. These social and economic needs are partially addressed through existing social policy and legislation but the extent and magnitude of assistance varies both quantitatively and qualitatively among jurisdictional lines (Rose, 1980).

For example, social assistance policies have been legislated federally through the Canada Assistance Program and through various provincial acts of legislation. Yet, the legislated social assistance policies may work to humiliate lone parents more than other family types (Lero and Brockman, 1993: 113). As these means-tested policies have been inconsistent, arbitrary, fairly intrusive, and even capricious between the provinces (and territories), lone parents may become frustrated in their attempt to sustain or further their

economic situation from one of dependency to self-sufficiency (National Council of Welfare, 1992; National Council of Welfare, 1995b). In Manitoba, Ontario, and Nova Scotia, the problems are exacerbated as these three provinces have two-tier systems. In effect, municipalities in each of the three provinces are given vast discretionary powers over the social assistance programs and the individuals who receive social assistance (National Council of Welfare, 1995a).

Although there exist a number of criticisms of the Canada Assistance Program, more uncertainty may be in the future of lone parents and other individuals in need of social assistance within Canada. The replacement and combination of the Canada Assistance Program with health and education legislation into the single Canada Health and Social Transfer on 1 April, 1996 has the potential for creating even more arbitrary and inconsistent policies and practices by province and between family types. Ultimately, this could be the result of the devolution of Federal government powers and jurisdiction to the provinces. The degree to which the Canada Health and Social Transfer works to exacerbate, or ameliorate, income differences and housing needs requires substantial evaluation in the near future.

Another example of differing governmental response is the general trend of past analyses to utilise national or provincial spending levels as an indication of the quality of housing. Housing social policy costs for lone parent families

are measured in terms of domestic output (or gross domestic product) or qualitatively in the form of governmental policy level analyses. Unfortunately, these methods of determining housing needs for lone parent families have inherent difficulties in their operationalisation, measurement, and interpretations. Kangas (1991) has concisely noted that the use of gross domestic product or other macro level aggregated measures as an indication of the level and quality of social programs for the lone parent family are problematic and may actually only serve as rudimentary measures for comparative analyses with other nations. Of the few inferences which this method of analysis permits, all offer nothing more than mere generalisations of social program funding levels rather than program quality, delivery, or accessibility for the lone parent family.

Although there may exist differences between the lone parent family and other family types which have not been addressed, there remains one additional and substantial consideration for the present study. A third difficulty in effectively measuring housing needs for the lone parent family is the life cycle of the family (Klodawsky, Spector, and Rose, 1985). The life cycle of the lone parent family reflects the changes in socioeconomic factors and familial relations which occur over time due to present, past, or future events in the life of the lone parent. This can include reformation (and even subsequent dissolution) into new family types, restricted

educational and employment opportunities, and low levels of non-custodial parental support (McKie, 1993: 54). Moreover, these life occurrences must be evaluated qualitatively through time intensive and cost prohibitive longitudinal studies. As a result of the inherent difficulties measuring the life cycle of the lone parent family, lone parent families have not been often regarded as actual or permanent household types in research undertaken in Canada (Klodawsky, Spector, and Rose, 1985: 2-1; Hudson and Galaway, 1993: 343; Lero and Brockman, 1993: 96; McDaniel, 1993: 208).

With the dramatic multiplication of the never married lone parent, which constituted over thirty five percent (35.6 %) of Canadian lone parent families in 1991, assumptions about reformation are now being seriously challenged for policy direction (Eichler, 1993; Gee, 1995: 93-94). Finally, Lefaucheur and Martin (1993: 39) have also included that the socio-professional trajectories of the parent, the types of relationships established with non-custodial parents, and the various strategies employed to manage as a lone parent are also important qualitative considerations for measuring housing needs of the lone parent family.

Although the current research may be considered a 'snapshot' of housing needs for the lone parent family, a true longitudinal qualitative study is beyond both the temporal scope and financial limitations of the current study. Each of the considerations noted above require substantial inquiry in

future research. Notwithstanding the considerations listed above, an evaluation of the socioeconomic variables underlying the housing needs of the lone parent family can still be adequately investigated. In fact, the methodology to be utilised in the current study should be further developed to facilitate the longitudinal study of the lone parent family in the near future. Therefore, this chapter will demonstrate how housing needs can be both theoretically defined and operationally measured to access the quality of life for the lone parent family. Furthermore, the socioeconomic variables utilised in the measurement of housing needs can provide an indication of and conceptual framework for the continued measurement of the quality of life for the lone parent family.

Housing Need

In this study, the concept of housing need and housing needs will be utilised to refer to the shelter requirements of a family or household. These requirements include shelter characteristics such as its functionality, spatial arrangements, and maintenance and shelter costs for the family which resides in the particular dwelling. Each of these characteristics will be defined below into the separate dimensions of housing need as affordability, suitability, and adequacy.

A family can be said to be experiencing housing need when it is required to forego either shelter characteristic aspect in order to improve another. For example, a low income family may have to allocate an inordinate amount of their income to obtain the necessary dwelling functionality and spatial arrangements. Similarly, the same family could be constrained to disburse only an economical amount of their income on shelter and live in accommodations which do not meet either the spatial or functionality requirements of the family. These two speculative scenarios suggest that the determining factor of housing need is the ability of the family to pay the cost of housing to meet these multiple needs. In fact, the majority of research and past public policy on the lone parent family has concluded that income supplements would alleviate any deficiency in the ability of the family to pay the shelter costs. Yet, as noted previously, income is not the panacea of explanation as government subsidy programs should have already eliminated housing need within Canada. Therefore, this study shall further explore the relationship of the three dimensions defining housing need.

On the basis of the three dimensions adequacy, affordability, and suitability, a household will be said to have housing need if it experiences at least one of the three housing problems. Nick Van Dyck (1993) has provided an excellent review of the Core Housing Need Model under the Canada Mortgage and Housing Corporation's *Strategic Plan 1991-*

95 which can appropriately serve as a defining guideline for the parameters of the current study.

Housing Adequacy

Historically, housing adequacy has been defined by the presence of basic facilities within a dwelling such as indoor plumbing, heating, and electrical amenities. However, a very limited number of urban residences do not have such conveniences today in Canada. As such, the contemporary definition of housing adequacy refers to the general physical condition of the housing, including such aspects as the structural soundness, state of repair, and level of maintenance required. Dwelling construction and restoration standards have been established in Canada by the Canada Mortgage and Housing Corporation. Yet, the collection of national housing adequacy data is deficient--a phenomena which is both prevalent and common in the industrialised nations (Karn, 1973).

In Canada, Statistics Canada collects national data on the adequacy of housing within Canada. The information is stratified by the construction dates of the dwelling and tenure of that dwelling. With this, the housing adequacy level has been defined by Statistics Canada as requiring either regular maintenance only, minor repairs, or major repairs (Statistics Canada, 1993a). Although the measures

appear to be somewhat vague in terms of discriminatory ability with the usage of only three categories, the census data offer interesting insight into the housing adequacy levels within Manitoba.

The adequacy levels of Manitoba households are considerably different from national averages. In particular, the percentage of Manitoba dwellings requiring only regular maintenance was sixty-four percent (64.66%) in 1991 whereas the national percentage was slightly better with sixty-eight percent (68.22%) of households requiring only regular maintenance. Moreover, the percentage of dwellings requiring both minor and major repairs was higher in Manitoba than within the nation as a whole in 1991. In Manitoba, minor repairs accounted for twenty-five percent (25.37%) of all households and major repairs represented ten percent (9.98%) of all households. Canadian households measured somewhat lower for minor and major repairs in 1991. Nationally, minor repairs were required for twenty-three percent (23.61%) of dwellings and major repairs were required for only eight percent (8.16%).

Although the Statistics Canada data indicate a measure of housing adequacy, Karn (1973) has argued that internationally there exist a number of methods for the measurement of housing adequacy. As with any measurement of subjective phenomenon, Karn (1973: 8) noted that invariably difficulties will arise from the measurement of adequate housing due to fundamental

differences used in the measures of the housing standard for the physical structure. These problems would include such situations as the particular usage of different rooms or areas, the type of amenities in the household and within the surrounding community, and in the way in which the house is utilised. Karn (1973: 9) added that these problems of measuring housing adequacy are further exacerbated by indicating that international comparisons are difficult as most Organisation for Economic Co-operation and Development nations utilise very different and discrete measures, if at all, of housing adequacy at the national level.

Unfortunately, these difficulties in the measurement of housing adequacy require that a more qualitative approach would be required to effectively measure housing adequacy than that available for the current study. Furthermore, the limitations of using a secondary data source circumvent the possibility for the analysis of housing adequacy. As a result, the dimension of housing adequacy is beyond the scope of the current investigation.

Housing Affordability

Housing affordability will be defined as the relationship between the cost of housing for shelter and the gross family income of the household residing within that shelter. The ability of the family to pay for the shelter is determined by

the current gross income of the respective household. Therefore, housing affordability can be measured as a ratio in terms of gross income to housing for shelter cost on the basis of a predetermined governmental rate contribution standard. The current affordability ratio in Canada is defined as housing for shelter expenditures of less than thirty percent (30%) of the gross income for the respective household (Goldstein, 1990: 5-6; Filion and Bunting, 1990: 13; Van Dyck, 1993: 6). Until 1986, the governmental rate contribution standard was set at the ratio of twenty-five percent (25%) of household gross income to shelter for housing costs. In effect, a household which is expending thirty percent or more of their household gross income on shelter for housing costs can be defined as experiencing affordability difficulties. As housing affordability is directly related to family income, further discussion of the problems involving the dimension of affordability is found below in the income deficiencies section.

Housing Suitability

Housing suitability can be defined according to the National Occupancy Standard measures of household size and composition. In particular, housing suitability refers to the level of spatial arrangements by the number and relationship of individuals within a given individual household. The

criteria currently used within the National Occupancy Standard specifies that within a household, no more than two people should use a single bedroom, parents and children should have separate bedrooms, children over the age of five of opposite sex need not share a single bedroom, and adult residents over the age of seventeen receive separate individual bedrooms unless partnered (Van Dyck, 1993: 6). Essentially, housing suitability is determined by the basis of the household composition, familial relationships, and the number of bedrooms in the dwelling.

Cullingworth (1958) had argued that socioeconomic measures of housing condition were commonly calculated in terms of housing occupation density. That is, the number of individuals per room, or reciprocally, the number of rooms per person was used as a measure to determine if the housing was suitable for the particular family. Although this approach exemplifies the current assessment of housing suitability, the usage of housing density did not account for the adequacy of the housing, the size and use of the rooms, the particular needs of individuals based on age and relationship, and inadvertently aggregated all households irrespective of size so that variations between households and household types were obscured (Cullingworth, 1958: 346).

Along similar theoretical premises as Cullingworth, Akkerman (1982) argued that any household type and formation could be explained in terms of housing need by comparison of

a minimal occupancy standard. The demographic structure of the household would ultimately provide the minimum needs for suitable spatial arrangements due to these occupancy standards. Exclusive of socioeconomic variables, the measure of housing suitability could be determined through the number of rooms in the dwelling by the number of people utilising the household (Akkerman, 1982: 284-286).

The Core Housing Need Model

The Core Housing Need Model encompasses the three dimensions of adequacy, affordability, and suitability into a mechanism to allocate funding for housing need. Since 1986, the Canadian and provincial governments have adopted the Core Housing Need Model in the assessment of housing need and subsequent social housing assistance. Although past governmental assistance included such considerations as vacancy rates, new housing ideas, and special housing requirements, the adoption of the Core Housing Need Model has standardised the distribution of funds on a more uniformed basis (Van Dyck, 1993: 5).

It should be noted that the allocation of funding from the federal government through the Canada Mortgage and Housing Corporation is based on the total combination of the three dimensions adequacy, affordability, and suitability. For example, the Core Housing Need Model will define a household

in only 'voluntary need' when the housing costs are over thirty percent of family income but the dwelling meets the criteria for adequacy and suitability. Similarly, a dwelling in need of major repairs and/or lacking essential facilities such as heating or plumbing, but both affordable and suitable for the household, is also defined to be only in 'voluntary need' (Van Dyck, 1993: 6). Whereas, a household defined in 'core need' is one which is "unable to obtain unsubsidized market housing meeting suitability and adequacy norms without spending 30% or more of their income on rent" (Van Dyck, 1993: 7).

While the distinction between voluntary and core need would appear to be somewhat arbitrary, the standards established provide a mechanism to allocate funding on a provincial means test basis. The federal housing assistance funds are proportionally dispersed to each province according to that province's measure of core housing need (Van Dyck, 1993: 11). The federal allocation of funding occurs through a two tier core housing need identification scheme (Carter, 1987). The first level identifies the degree of adequacy, affordability, and suitability for households within a given province. Then, a second stage of assessment associates family incomes to the average cost of housing in that province. As such, the federal government allocates funding utilising aggregated estimates and assumptions which likely do not accurately reflect the housing need in that province of

actual adequacy, affordability, and suitability levels but rather reflects the ability of the family to pay on the private market (Van Dyck, 1993: 56-57). Yet, the Core Housing Need Model appears to be the most effective means to date in the distribution of monies to subsidise housing.

In 1938, the *National Housing Act* was passed in Canada to establish safeguards against these types of problems (Rose, 1980). In particular, a housing crisis resulted from an unprecedented increase in household formation rates in the post-war period (Rose, 1980; Filion and Bunting, 1990: 14). Yet, the policies enacted under the *National Housing Act* led to improvements of home-ownership by middle income families rather than low income families (Steele, 1990: 23). The *National Housing Act (1944)* is presently administered by the Canada Mortgage and Housing Corporation and was previously administered by its predecessor, the Central Mortgage and Housing Corporation (Canada, 1945; Canadian Council on Social Development, 1972; Canada Mortgage and Housing Corporation, 1979).

In the mid-seventies, the Canadian government became more attentive to the rising cost of housing and the corresponding decrease to housing access for low income groups within urban centres (Goldstein, 1990: 2). Even though the Core Housing Need Model has recently directed focus on the housing conditions of adequacy, affordability, and suitability, housing in Canada does not share the same status as housing

programs in other Organisation for Economic Co-operation and Development countries (Brink, 1988: 20). This is primarily due to the different underlying societal assumptions about the role of the state in housing policy.

More recently, the Canadian government (under the auspices of the Canada Mortgage and Housing Corporation) had begun the study of housing conditions for various economically disadvantaged groups. These programs have been initiated to look at the policy and practice of meeting the needs for economically disadvantaged groups. Brink (1988: 22; Canada Mortgage and Housing Corporation, 1985) has summarised the major objectives of Canadian housing policy administered by the Canada Mortgage and Housing Corporation into the following four goals:

a). to assist those unable to gain access to adequate housing in the market by supporting, in conjunction with the provinces, municipalities or their agencies, low and moderate income public housing and the establishment of non-profit and co-operative housing corporations;

b). to promote and support the rehabilitation of substandard housing, the improvement of existing housing, and the conservation of housing stock;

c). to promote the effective operation of mortgage and housing markets, and;

d). to assist in the achievement and maintenance of sound community environment by supporting the provision of basic community services.

In 1986, the Canadian Government undertook an evaluation of the efficiency of the various programs related to meeting social housing needs. The Nielson Task Force on Program Review (Canada, 1986) was initiated to identify the successes and failures of social and public housing policies under the Canada Mortgage and Housing Corporation within Canada. The Nielson Task Force concluded that low income families could not afford the existing accommodations and that the social housing "program did not target aid to those most in need" (Goldstein, 1990: 4-5).

2.3 THEORETICAL EXPLANATIONS OF HOUSING NEED

The purpose of this section is to examine the theoretical explanations and conceptual framework which will guide the present analysis of lone parent family housing needs. A considerable amount of literature and research exists which assesses housing needs of the lone parent family in terms of income as the primary causative variable. Without exception, the literature demonstrates that the problem most lone parent families face in obtaining affordable and suitable housing is a deficiency of their family income. Yet, there is considerable diversity in theoretical premises from which to understand how housing needs come about. Furthermore, as noted above, simply suggesting that family income is the only independent variable in this equation would not account for the inadequacies of income and housing subsidies evident through previous public policy. Ultimately, there must be other variables which significantly predict housing need for the lone parent family. Therefore, in order to further understanding of how income deficiencies result, it is necessary to review the theoretical suppositions of past research and move into an examination of the dimensionality of housing need for the lone parent family.

In an effort to succinctly address the causes of housing need for the lone parent family, it is necessary to undertake a systematic delineation of the empirical variables which are indicative of housing need. To further this end, this section

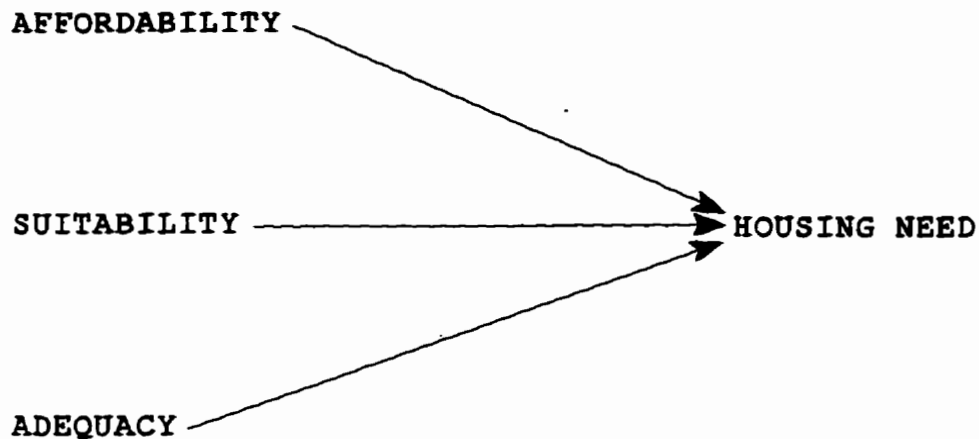
will be organised into three primary components. The first part will address the dependent variable of housing need for the lone parent family. The second portion will address the underlying independent variables which will serve as explanation of housing need for the lone parent family. Finally, the latter part will present the synthesis of these variables into a coherent theoretical model from which hypotheses and a subsequent empirical analysis of the lone parent family may ensue.

Dependent Variable

As noted above, the housing needs of the lone parent family is the definitive dependent variable. As illustrated within Figure I, the three dimensions of the Core Housing Need Model include adequacy, affordability, and suitability. The combined measurement of these three dimensions constitute the actual measure of housing need for the lone parent family. Yet, there are very distinctive limits to the measure of all three dimensions simultaneously. In particular, the measurement of housing adequacy with the dimensions of housing affordability and suitability introduces two very distinctive problems in the measurement and analysis of lone parent family housing needs.

The first difficulty in the measurement of housing adequacy results from the inherent subjective nature of such

FIGURE I
Core Housing Need Model



an indicator of housing need. The study and analysis of housing adequacy relies on an interpretation of the subjective perception that a household has of its dwelling adequacy. Although there exist numerous qualitative studies which evaluate housing adequacy for particular communities or urban centres, the qualitative analysis of housing adequacy in which the lone parent reside have not been sufficiently standardised through replication and reliable empirical means.

For example, Simon and Werkele (1987) investigated the housing adequacy of the Frankel-Lambert neighbourhood in Toronto. They concluded that housing adequacy priorities differed significantly between the housing project planners and the residents, a high percentage of which were lone parent

families (Simon and Werkele, 1987: 177). As well, Bunting (1987: 81) has noted in a qualitative study of housing adequacy within Kitchener that some evaluations rely on socio-psychological attitudes or assessments of building permits, each of which are "notoriously unreliable." Yet, Bunting (1987) demonstrated the cost prohibitive and time consuming nature of such analyses. Finally, McFadyen (1994: 151-169) concluded that measures of housing satisfaction in the determination of housing adequacy were directly related to the housing affordability for the lone parent. Although these are but a sample of the existing qualitative research, the diversity of each is indicative of an inherent problem in the measurement of housing adequacy.

Juxtaposed to this subjective evaluation by a household, is an equally subjective evaluation by a research assistant. Although a research assistant may have some formal training in the evaluation of housing adequacy, there nevertheless remains a very distinctive subjective aspect to the measurement of housing adequacy. In essence, Nachmias and Nachmias (1992: 107) have defined this difficulty as instrumentation. That is, when a measurement is taken of a phenomenon such as housing adequacy, the reliability in assessment of the phenomena must be demonstrated so that repeated and replicated measures do not differ due to the method of measurement itself.

The variance in repeated measures or variable errors during any single measuring case or measurement temporally varied is known as a variable error. A variable error results because of the degree to which an error varies from a single observation to another and the amount of error for a given observation can be different each time it is measured (Nachmias and Nachmias, 1992: 163). This does not mean that subjective phenomena such as housing adequacy should be disregarded, rather, it suggests that housing adequacy must be evaluated with a more reliable indicator of the phenomena it purports to measure. Furthermore, this would suggest the need to develop a survey or observational mechanism to standardise research of housing adequacy by both academics and policy makers alike for future research. Although standardised means are becoming more common, the Winnipeg Area Study has yet to adopt such measures.

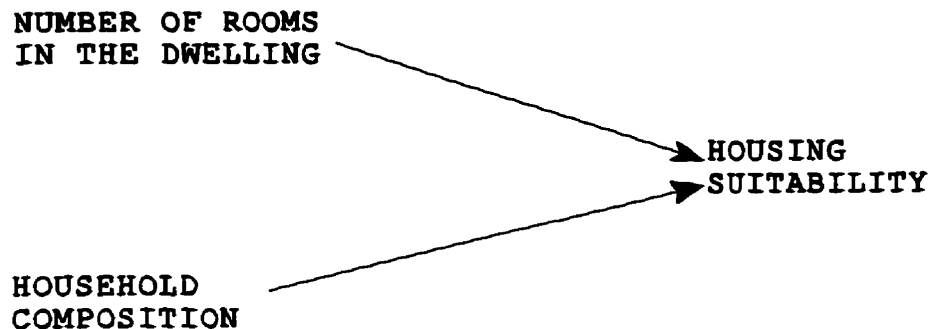
The second complication in the measurement of housing adequacy stems from the first and can be defined as the cost of undertaking qualitative research such as this. The nature of such an undertaking on a national scale would be extremely expensive. Sufficiently trained researchers would be required to undertake identical evaluations of the adequacy of each household. In fact, implementing such an evaluation in conjunction with the collection of census data would not be possible due to the necessary resources required for such an undertaking. If this collection was facilitated through

standardised self-reporting surveys, census costs would obviously increase but the benefit for research and public policy would surely outweigh those costs. Although the dimension of housing adequacy appears to be beyond measurement for this study due to the secondary data of the Winnipeg Area Study, the two dimensions of housing affordability and housing suitability will permit the development of multi-causal analysis.

It is recognised that utilising only the two dimensions of housing affordability and suitability limit the empirical findings somewhat. Moreover, the above definition and measurement of housing needs are undoubtedly only partially complete measures of the real lived aspects of lone parent families as only two dimensions of their housing need are addressed. Due to the lack of access to available data on housing adequacy for the lone parent family within the Winnipeg Area Study, housing affordability and suitability must be utilised as the measure of housing needs.

Housing suitability constitutes the second dimension in the measurement of housing need serving as the dependent variable. As demonstrated within Figure II, the number of rooms and the household composition are the defining variables represented by the dimension of housing suitability. For the purposes of this study, housing suitability will be measured utilising the variable which indicates the number of rooms in each household. The number of rooms in the household will be

FIGURE II
The Measurement of Housing Suitability



weighted by the second independent variable of household composition. That is, the number of individuals the family is comprised of will be utilised as the second independent variable for the dimension of housing suitability. The particular derived indexed housing suitability measure will be completely delineated within chapter three.

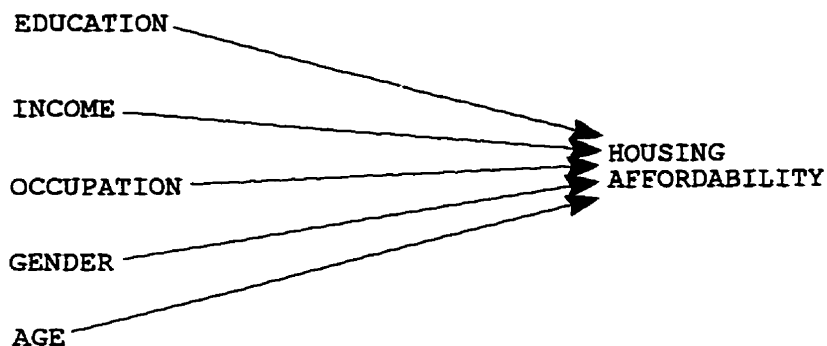
In conclusion of the discussion surrounding the dependent variable of housing need, it is appropriate to present a model which will serve as the basis for the development of the postulates for the hypotheses to be tested. The overall relationship of the independent variables, the dimensions of housing affordability and housing suitability, and the dependent variable of housing need will be presented below under the section pertaining to the hypotheses. Thus, the

review of the theoretical literature must shift to focus on the independent variables prior to the dissemination of a heuristic model and the hypotheses to be empirically tested within chapter four.

Independent Variables

The measurement of housing need for the lone parent family requires a specification of the independent variables which act as agents for change or can explain change in the dependent variable (Rea and Parker, 1992: 189). Within the current literature, many variables have been espoused as causal explanations of the dimension of housing affordability for the lone parent family. The single most significant causal independent variable investigated in the literature is household income. Yet, the current study proposes that the independent variables directly responsible for the determination of housing affordability for the lone parent family include the variables of socioeconomic status, gender, and age. Socioeconomic status is a construct of variables which can be further defined as a measure of the independent variables income, education, and occupation. Evident from Figure III, the combination of the independent variables serves to illustrate the dynamic relationship that underlies the housing affordability of lone parent family housing needs. Explicit in the distinction between two parent families and

FIGURE III
The Measurement of Housing Affordability



lone parent families is the independent variable measuring the number of parents in the household. Obviously, a measure of each independent variable which explains housing need is required in order to formulate an operational definition of the more salient independent variables within the current investigation.

Lone parent housing needs are a phenomena which tends to be explained as an outcome of other factors rather than the independent variables of socioeconomic status, gender, and age. For example, housing needs of the Canadian lone parent family have been directly explained as a result of such problems including the lack of a car, the threat or actuality of violence in the household, and the housing tenure and history of the family. Furthermore, some housing needs researchers have attributed the differentiated inability of

lone parents to meet both housing affordability and suitability needs to the increasing rates of divorce within Canadian society (Goldberg, 1990: 77). Yet, as is evident from the housing needs of lone parent families headed by men, the independent variable of divorce would only serve as a superfluous causal explanation or as a proxy indicator of socioeconomic status at best (Greif, 1985). Therefore, one must seek other measurable and testable indicators to develop an appropriate operational definition for evaluating housing conditions for the lone parent family.

Klodawsky, Spector, and Hendrix (1983) have noted that this orientation in causal explanation was representative of the majority of work done on lone parent housing needs in the United States between 1960 and 1975. Yet, they have critically noted in their reviews of previous research that the underlying variables of housing need for the lone parent family were commonly revealed as both family income and gender. As such, they concluded that these two independent variables were "the most useful means by which to distinguish among single parents and their housing circumstances and problems" (Klodawsky, Spector, and Hendrix, 1983: 14). They further noted that it was clear that the variables of age and family composition also perform a significant function in the definition of the constraints which are imposed upon the lone parent family. These constraints are indicative of the lone parent family's housing requirements and the capacity to meet

their housing needs (Klodawsky, Spector, and Hendrix, 1983: 42). Ultimately, Klodawsky, Spector, and Hendrix (1984) have argued that income constraints are the primary explanatory variable in the measurement of housing need for the lone parent family.

In order to conceptualise the measurement of housing need for the lone parent family, each independent variable will be discussed and placed within an appropriate theoretical framework. This will serve to establish the relevance of each independent variable in the analysis of housing need for the lone parent family. The rationale for extending the analytical framework to include an assessment of the household's socioeconomic status, gender, and age characteristics is driven by a recognition that these independent variables directly influence the ability of the household to satisfy its housing needs.

Socioeconomic Status

Socioeconomic status is a construct of variables which are indicative of the class position in which the family resides. That is, socioeconomic status is a combined measure of social stratification or social inequality which determines or precedes such phenomena as the obtainment of affordable and suitable housing. In effect, socioeconomic status can be defined as a relative measure of the household ability to

generate resources for acquiring the basic quality of life necessities such as their housing needs. As well, socioeconomic status distinguishes the class of a family or household, and subsequently their needs, such that social researchers can differentiate between individuals and groups of individuals based on this construct. Yet, how does one go about operationally measuring socioeconomic status to meet the measurement needs of social researchers?

Many social researchers have adopted either one of three approaches in the definition of socioeconomic status but very few have given an adequate operationally defined construct for empirical measurement. The three approaches of measuring socioeconomic status accepted in the literature can be defined as the human capital model, the occupational ranking scale model, and the status attainment model (Ornstein, 1983; Forcese, 1986). In general, these three approaches have utilised the independent variables of income, education, and/or occupation in the measurement of socioeconomic status. As well, each of these models utilise independent variables which are pedagogically accepted measures which result in either a discrete or continuous measurement of socioeconomic status to facilitate empirical analysis. Therefore, each theoretical framework requires a brief description to determine and assess which is the most appropriate to facilitate understanding of housing needs for the lone parent family within the current study.

The human capital model is a measure of socioeconomic status which utilises the independent variables of income, education, and occupation. The income of an individual or household is determined to be the result of the investment that individual household effects in their combined education and the previous experience each member has within the labour market. In effect, the income of the individual is conceived as a reward for obtaining both high educational levels and considerable labour force experience (Becker, 1964). Yet, as Ornstein (1983: 42-47) has noted, the human capital model only evaluates the socioeconomic status of the individual household divorced from other socioeconomic or structural variables. For example, the human capital model assumes that income is derived from a homogenous labour market, that employers nor unionisation play any role in income levels, and that differences between men and women and between visible minorities are simply a matter of luck. Yet, luck has been demonstrated to account for the differences not explained by individual variables and results in "more than two-thirds of the total variance in income" (Ornstein, 1983: 43). As a result of this deficiency to account for structural variables or individual variables in the assessment of housing need for the lone parent family, the definition of socioeconomic status must now turn to the occupational ranking scale to pursue a more sufficient theoretical framework.

The second method commonly accepted for theoretically defining socioeconomic status is known as the occupational ranking scale model. In essence, the occupational ranking scale model is a hierarchical ranking of all labour force occupations from low to high. Blishen (1967) originally proposed the occupational ranking scale model and it has become a widely accepted quantitative measure of socioeconomic status. The occupation of an individual is established and then subsequently ranked. After the establishment of the initial index, that rank is then scaled by the mean income and mean education for the occupation of the particular individual (Blishen, 1967: 42). Initially, the scale was then separated into seven class intervals to represent socioeconomic status (Blishen, 1967: 51). In a subsequent revision of the scale, Blishen and McRoberts (1976) rank ordered the labour force occupations into six different categories for socioeconomic status analyses.

The occupational ranking scale model is dependent upon current occupational designations within the labour force. As such, the scale does not truly incorporate upper class designations related to the socioeconomic status of either propertied wealth or state power (Forcese, 1986: 17; Ornstein, 1983: 43). Furthermore, occupations not in the labour force such as volunteer work, child rearing, household maintenance, or even work in underground economic activities are simply excluded from the occupational ranking scale model. As well,

there are definitional problems in the interpretation of employment positions recorded for each individual. In essence, the occupational ranking scale model truly represents an occupational ranking according to the prestige of each labour force position rather than an indicator of true socioeconomic status. Therefore, the aggregated occupational emphasis in the measurement of socioeconomic status leads to an emphasis upon status groups and strata rather than a distinction between either economic or educational differences (Forcese, 1986: 19). Forcese (1986: 17) has argued that this technique is really a crude, but useful, indicator of social class and occupational stratification but the theoretical framework only becomes useful in its ability to transcend national borders for comparative research purposes. Therefore, rather than merely dismissing the occupational ranking scale model outright, the model will be utilised as a guiding technique in the quantification for the occupation of an individual as used within the third theoretical framework.

The third theoretical method for measuring socioeconomic status is known as the status attainment model. The status attainment model incorporates the variables of income, education, and occupation into a theoretical scale which empirically measures the socioeconomic status of an individual relative to other individuals (Blau and Duncan, 1967; Duncan, Featherman, and Duncan, 1972). Ornstein (1983: 42-43) has discussed the status attainment model as one which provided

the first framework for quantitative analysis which sufficiently integrated the independent variables of education, occupation, and income into a succinct theoretical framework. Yet, this technique and the variables incorporated into the status attainment model fails to theoretically account for other independent socioeconomic variables which create differences in socioeconomic status such as gender or age (Ornstein, 1983: 43).

Typically, the theoretical discussion which results from the above arguments focuses upon substantive issues in the measurement of socioeconomic status. Obviously, there is no one theoretically established technique for the empirical measurement of socioeconomic status nor should there be one. Each of the above models of socioeconomic status reveal a striking pattern which is of concern for the current study. All three theoretical frameworks inevitably result in a quantified measure of a combination of socioeconomic variables. Although there is a comparative advantage to the creation of a single indicator for socioeconomic status, there are considerable theoretical and measurement advantages in not combining the variables within a single measure. In effect, the ability to empirically analyse the differences between lone parent families and other family types separately based on either education, income, or occupation is facilitated through independent measures. Therefore, it is maintained that a more appropriate theoretical framework to measure the

socioeconomic status of the household is one which does not collapse each of the independent variables into a single categorical measure but one which utilises the distinct theoretical strengths of the three independent variables of education, income, and occupation separately.

Education

Education is a measure of the formal education levels which directly contribute to the acquisition of income. As well, it is a measure of the potential for future and increased levels of income. As noted above, education is key in the determination of socioeconomic status. There is a direct correlation between the education of an individual and their income. That is, well educated individuals generally earn more income than less educated people. Although education is a measure of formal training for an occupation, it does not include other indicators of socioeconomic status such as income, gender, and age.

Income

The literature demonstrates that both women and men encounter substantial income barriers in obtaining both affordable and suitable housing. As the previous literature would suggest, some women and men are meeting their housing

needs. Yet, it becomes evident from the preceding discussion that the underlying variable of household income has a predominance in the theoretical and empirical explanation of housing needs for the lone parent family. Furthermore, such housing needs can not be solely explained by differentiations of income and require that an understanding of the complex interactions between socioeconomic variables be developed to further the examination of the lone parent family.

The socioeconomic variable of income will be extensively used in this study and, for the purposes of measurement, will refer to the ability of the household to generate resources required to purchase basic goods and services. Households with incomes at or below the minimum level required to purchase basic goods and services are deemed to be income deficient. The concepts of personal income and household income will be used reciprocally in the discussion of the lone parent family for obvious reasons.

Household income shall refer to financial income reported by all family members older than fourteen years of age. The household income encompasses the gross wages and salaries of all adults and income from either self-employment, investment income, or government transfer payments (this includes such sources of revenue as the federal child tax benefit, provincial tax credits, and old age security). As well, pension revenues and other miscellaneous income such as scholarships and child support payments are included in the

definition of income. The definition of income does not include revenues (or losses) from gambling, capital gains, the sale of property or personal possessions, income tax refunds, loans from lending institutions, settlements of insurance policies, nor income gifted or donated to the family (National Council of Welfare, 1995a: 4-5). In order to determine what the minimum level of household income essential for meeting the required adequate housing need levels, the Statistics Canada definition of the low income cut-off level will be employed within the current study.

The low income cut-off established by Statistics Canada represents a theoretically derived measure of the ability for any given household to purchase the necessary goods and services required to meet their basic needs. In order to determine the low income cut-off, the average percent of the gross family income is first calculated for the entire population of households within Canada to determine the baseline level which designates the proportion of income which families spend for food, shelter and clothing. The proportion is stratified by the number of individuals within the household and the size of the population centre they reside within. Then, somewhat arbitrarily, the low income cut-off is set at twenty percentage points above the derived percentage baseline value as an indicator of the reasonable additional burden a family can endure (National Council of Welfare, 1995a: 2). For example, a family of two individuals in 1991

within Winnipeg would have a low income cut-off calculated to be slightly over twenty thousand ($\mu=20266$) dollars regardless of the age or familial relationship between the two members (National Council of Welfare, 1993: 2). Although there are inherent difficulties in this measure, the low income cut-off is an useful technique for defining and analysing the portion of the Canadian population defined as low income or income deficient. There are other measures of poverty and income deficiencies utilised in Canada but the low income cut-off is the most widely accepted and is comparable to other measures (National Council of Welfare, 1995a: 4).

As can be seen from Table I, the low income cut-off measures indicate a number of interesting findings from 1991. First, the number of families ($n=47000$) under the low income cut-off within Manitoba was relatively higher than that of Canada ($n=949000$) as a whole. It is also important to note that the number of lone parent families headed by women under the low income cut-off was unproportionately high when compared with two parent families. For lone parent families headed by women, the average difference between the low income cut-off and the mean income for those under the low income cut-off was over nine thousand dollars ($\mu=9051$) for 1991 (National Council of Welfare, 1993: 14). As well, the number of children living under the low income cut-off is of notable concern as the poverty rate for children within lone parent families headed by women was extremely high in comparison with

TABLE I
Selected Family Types and Children Below the
Low Income Cut-Off, 1991

	Below Low Income Cut-Off	Poverty Rate	Category Total
Total Canada Families	949000	13.1	7244275
Total Two Parent Families	658023	10.7	6402084
Women Lone Parent Families	488020	61.9	788401
Total Canada Children	1210000	18.3	6612022
Canada Lone Parent Children	496000	65.8	753799
Total Manitoba Families	47000	17.1	274854
Total Manitoba Children	72000	26.9	267658
Manitoba Lone Parent Children	19000	66.0	28788
Total Manitoba Population	218000	21.1	1033175
Total Canada Population	4227000	16.0	26418715

Source: National Council of Welfare, 1993;
Statistics Canada, 1993b.

all children. Two-thirds of all children within lone parent families headed by women live in relative poverty in both Manitoba and Canada.

Both the Federal and the Manitoba governments have maintained and legislated that family income is a direct causal factor contributing to the housing needs of the lone parent family. In fact, there is a rent supplement program which is cost shared between these two levels of government, and the Municipality of Winnipeg, to offset the disparity of

income deficiencies. In effect, each government has delineated the relationship between family income as highly significant and use family income measures for housing subsidisation guidelines. Moreover, in the fiscal year ending March 31, 1990 the federal and provincial government jointly contributed \$4,058,659 (\$2176255 by the federal government, \$1882404 by the province) to subsidised housing in Manitoba to reduce the rent of low-income tenants to twenty-five percent (25%) of their income (Manitoba, 1990: 17). In fact, the Manitoba provincial government has specific non-profit housing development schemes which finance public housing, municipal housing, private housing, and rural and northern housing (Manitoba, 1990).

Clearly, the discrepancy between the income of women lone parent families and other family types is existent and substantial. In terms of constant 1986 dollars, it becomes evident from Table II that the income distribution is dramatically different for families within Canada. Although the Statistics Canada data presented within Table II does not discriminate between incomes of men and women lone parent families, the average and median incomes for women headed families reveal some interesting findings. In particular, women headed lone parent families were most likely to have incomes at the lowest income levels while lone parent families headed by men were more likely to reflect the income distribution of two parent families. Finally, the data

TABLE II
Average Canadian Household Income by Family Types, 1981-1991:
(in constant 1986 dollars)

Year	Women		Men		All Families	
	<u>Headed Families</u>		<u>Headed Families</u>			
	Mean Income	Median Income	Mean Income	Median Income	Mean Income	Median Income
1981	21405	17493	41541	38115	39527	36233
1983	19490	14762	40695	36355	38508	34273
1984	20563	15671	40149	36355	37978	34150
1986	21015	16835	41816	42842	39589	35384
1987	21856	17508	42993	38551	40887	36455
1988	21783	17679	43981	39449	41739	37228
1989	23511	18745	45099	40161	42975	38199
1990	22360	17090	44572	40068	42233	37765
1991	21849	17170	43446	38520	41090	36066

Source: Statistics Canada, Catalogue 13-208.

presented within Table II demonstrate that the income of the lone parent women should play a key role in the measurement of housing needs in Canada (McClain and Doyle, 1984: 44; Goldberg, 1990: 79). Obviously, a common aspect of the literature review thus far has been an emphasis on deficient income of the lone parent family.

Occupation

As well as the difficulties of finding affordable and suitable housing, it has been argued that lone parent women

have been impoverished through the labour force. Statistics Canada has defined for census purposes occupation as the kind of work a person was doing during the census reference week through reporting their kind of work and a description of the most important duties in the job for people over the age of 14. People with two or more jobs were to report the information for the job at which they worked the most hours. Each occupation was coded to a four-digit level which is determined through either of two different classifications: the 1971 Occupational Classification (historical comparisons) or the 1980 Standard Occupational Classification. The 1980 structure has 22 major groups, 80 minor groups and 514 unit groups and will constitute the definition utilised within the current study (Statistics Canada, 1990a: 9).

Gender

Goldberg (1990: 77) has noted that the number of families headed by a lone parent increased in Canada by approximately 130 percent from 1966 to 1986. As well, Hudson and Galaway (1993: 335) have stated that lone parent families have increased by approximately one hundred and eighty percent (180%) from 1951 to 1986 and that the growth rate of the lone parent family is three times that of the two parent family. In fact, the number of lone parent family households had grown to almost one million (n=953640) in 1991 (Statistics Canada,

TABLE III
Canadian and Manitoban Family Types by
Number of Children, 1991 (Percentages)

Number Children	Lone Parent Women	Lone Parent Men	Two Parent Families
1	458585 (58.17)	103090 (62.39)	1381295 (36.06)
2	239405 (30.37)	45930 (27.80)	1646085 (42.98)
≥ 3	90400 (11.47)	16215 (9.81)	802865 (20.96)
Canada	788390	165235	3830245
1	17000 (55.87)	4130 (59.94)	50095 (34.16)
2	9065 (29.79)	1970 (28.59)	61115 (41.67)
≥ 3	4365 (14.34)	790 (11.47)	35445 (24.17)
Manitoba	30430	6890	146655

Source: Statistics Canada, 1993b.

1993b: 8-13). Fallis (1990: 882) found that the most rapid growth in Canadian household types in the eighties had been those households which were comprised of lone parent families. Overwhelmingly, the family structure which increased most dramatically had been the lone parent family headed by a woman--women comprise between eighty and ninety percent of all lone parent families, and, for those families headed by an individual between the ages of 15 and 24, women constitute well over ninety percent of the family headship rates (Goldberg, 1990: 77).

Evident from Table III, lone parent women constitute the headship for the majority of lone parent families. As well,

it must be noted that the lone parent families tend to have less children in comparison with two parent families. Moreover, it is interesting to note that women lone parent families constitute almost eighty-three percent (82.67%) of the lone parent families in Canada and eighty-one and one-half percent (81.54%) of lone parent families within Manitoba. Furthermore, lone parent families comprised twenty percent (19.93%) of all families with children in Canada and slightly over twenty percent (20.29%) of families with children within Manitoba.

The disparity in income between men and women has nominally decreased in the last few years but low income remains one of the primary barriers to adequate housing for most lone parent women. Yet, the number of lone parent women whom were below the low income cut-off increased from fifty-four percent (54%) in 1986 to fifty-six percent (56%) in 1990 (McKie, 1993: 65). Furthermore, as demonstrated within Table I, the poverty rate for lone parent women had increased in 1991 so that sixty-two percent (61.9%) were below the low income cut-off. As well, there was an unemployment rate of ninety-three percent (93%) in 1986 for lone parent women which increased to ninety-six percent (96%) in 1990 (McKie, 1993: 65).

A majority of lone parent women increasingly must rely on either social assistance (provincial or municipal) or on some form of federal assistance such as transfer payments (in the

form of subsidised housing and non-profit housing), family allowances, or child-support supplements to meet the economic needs within our society (Statistics Canada, 1985; Dooley, 1993; Gorlick and Pomfret, 1993; Pask, 1993). Meeting these economic needs is usually not enough for these lone parent women: three-quarters of these women face housing affordability and suitability problems, and, of those women who have children under the age of five, almost ninety percent are likely to face similar situations (Stevens and Fogg, 1979: 84). In fact, McClain and Doyle (1984) and Dooley (1993) have established that recent trends indicated that lone parent women are becoming more dependent on government social welfare programs for their housing needs.

The Canadian Advisory Council on the Status of Women has speculated that this increase may be the result of a number of different possibilities. Morissette (1987: 2) has summarised that the different possibilities could be any combination of the following:

the impoverishment of social groups, including households headed by lone parent women;

the increase in the number of women who must provide for their own and the housing needs for their family;

rising rents and social attitudes that are slow to recognise changes in the make-up of the family, and;

population pressures within the cities, owing to the influx of immigrant families and of people from regions of high unemployment.

As a result, housing needs for the lone parent family potentially poses a fundamental societal dilemma for social researchers and government policy development. The majority of lone parent families are headed by women and approximately only one out of every eight lone parent families are headed by a man.

In a review of the literature prior to 1983, Klodawsky, Spector, and Hendrix (1983) found that gender influenced housing opportunities so that women were more likely having difficulties finding and paying for their housing. As such, they argued that the exclusion of male lone parents in any study would make it very difficult to develop an analysis and conceptualisation of the extent to which lone parenthood influences the types and degree of problems which the lone parent faces in meeting their housing needs (Klodawsky, Spector and Hendrix, 1983: 17).

Age

There is one qualification which needs to be made in regards to the selection of age as an independent variable in the assessment of housing needs. Within the urban housing literature, throughout the course of the family life cycle, the amount and type of living space changes "[a]s families form and grow, there is an expanding need for space--both internal and external to the dwelling unit" (Stevens and Fogg, 1979: 17). The age of the lone parent has been identified as an important contributor of the tendency to settle within a detached single dwelling for the household as the probability of owning a family home increases as one grows older (Klodawsky, Spector, and Hendrix, 1983).

A large group of those households in poverty are comprised of either the elderly or lone parent women in Canadian society (National Council of Welfare, 1993; Chappell, 1990). In the recent past, government housing policies have been directed towards disadvantaged groups, particularly targeted to low income lone parent households (Brink, 1988: 21). Because of the recent aging trend within the population of Canadian society, policy studies have been on the most part directed at analysing the increasing proportion of elderly people in Canada (Wigdor and Ford, 1981; Canada, 1983; Brink, 1988; Chappell, 1990). Yet, there are distinctive differences between lone parent families with respect to their life cycle stage.

TABLE IV
Canadian Lone Parent Families by Gender,
Labour Force Participation, and Age: 1991 (Percentages)

Age	<u>Men Lone Parents</u>		<u>Women Lone Parents</u>	
	One or More Family Members in Labour Force	No Family Members in Labour Force	One or More Family Members In Labour Force	No Family Members in Labour Force
≤ 24	1460 (73.6)	525 (26.5)	20090 (39.6)	30675 (60.4)
25-29	5695 (85.6)	955 (14.4)	47010 (57.4)	34840 (42.6)
30-34	13055 (88.7)	1665 (11.3)	74650 (68.0)	35165 (32.0)
35-39	20095 (90.1)	2205 (9.9)	94610 (78.8)	25445 (21.2)
40-44	27295 (93.6)	1865 (6.4)	100115 (86.3)	15905 (13.7)
45-49	24075 (94.9)	1300 (5.1)	73285 (89.3)	8800 (10.7)
≥ 50	56520 (86.9)	8525 (13.1)	189500 (83.2)	38300 (16.8)
Total	148195 (89.7)	17040 (10.3)	599260 (76.0)	189130 (24.0)

Source: Statistics Canada, 1993b: 184-185.

The relationship between the age and gender of the lone parent and their labour force status is reproduced within Table IV from the 1991 census data. As is evident from Table IV, there are strikingly divergent patterns within and between men and women lone parent families. Although the labour force status data includes any children which may be employed, the

results are indicative of the differences between men and women lone parent families. First, the employment rates demonstrate that women lone parent households were more likely to be unemployed than men lone parent households across every age category. Second, that the employment rate of the household increases with the age of both men and women lone parents. Finally, the lowest age category (≤ 24) illustrates an interesting phenomenon. The lone parent men had an unemployment rate of twenty-six percent (26.45%) but lone parent women had an unemployment rate of sixty percent (60.43%). Although the relationship of age to employment would be expected, the labour force participation for younger lone parent women is surprisingly low. As a result of the evident interaction of socioeconomic variables, the investigation must now introduce a number of formal hypotheses for guidance of the empirical investigation within the current study.

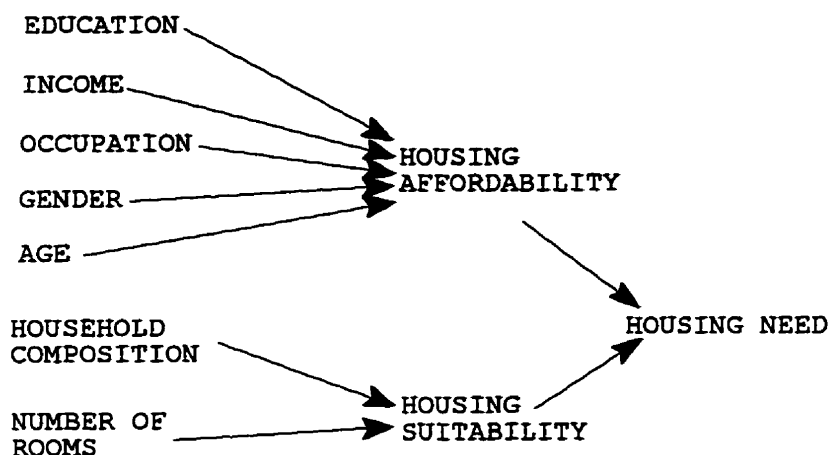
2.4 STATEMENT OF HYPOTHESIS

This section will proceed with a delineation of the research hypotheses for the study of lone parent family housing need. Based on the preceding review and discussion of the literature concerning housing affordability and housing suitability, a few fundamental questions will be put forward. From these questions, the research hypotheses of this study will be logically deduced and utilised. This will facilitate the completion of the conceptual frame from which the strength of each underlying variable, in the assessment of housing needs, may be both measured and predicted with a degree of accuracy. As well, the hypotheses to be tested will be explicitly stated to simplify the implementation of the empirical research.

As is evident from the previous sections concerned with the discussion of the dependent and independent variables, the relevant literature indicates that the dimensions to be utilised within the assessment of housing need consist of housing affordability and suitability measures. Thus, a number of questions and hypotheses can be formally introduced as guidelines for the subsequent empirical research.

As with the dimensions of housing affordability and suitability, the literature from the previously conducted studies reviewed above demonstrates that a number of distinct variables operate in the generation of inequities in housing with respect to both housing need and poverty. As evident

FIGURE IV
Socioeconomic Analysis of Housing Need for
Lone Parent Families



from Figure IV, the key explanatory socioeconomic variables identified by housing needs and poverty research are education, income, occupation, gender, and age. In the final analysis, the combination of these variable may operate together to some extent in the creation of housing affordability and suitability problems for the lone parent family.

The discussion presented in the above literature review demonstrate several things. First, that the increasing housing needs of the lone parent family are real and significant. Second, that a multivariate measurement of housing needs are uncommon and inconsistent throughout past

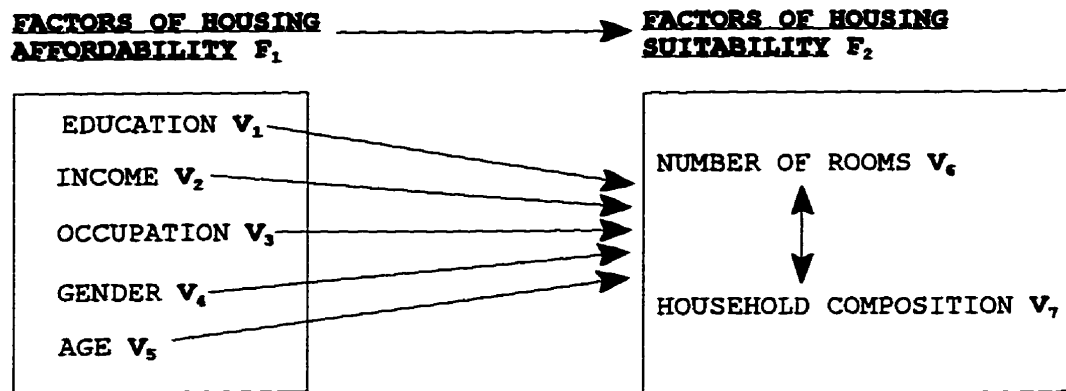
research. Third, that income has been shown as a major correlate and explanatory variable for the housing needs of lone parent families. Finally, that there are significant differences between lone parent families headed by men and women. Yet, a number of questions must be addressed so that the framework for the research and null hypotheses will be complete.

Obviously, the first and foremost question to arise is how salient is a multivariate analysis for the study of housing needs. As well, issues surrounding the significance of education and occupation in a measure of socioeconomic status remain unanswered in the housing needs literature. Furthermore, the variables of gender and age introduce a complex set of possibilities in investigating housing need for the lone parent family. As such, these questions require that the hypotheses be explicitly stated for the implementation of an empirical analysis and that a heuristic model of housing needs assessment may be presented.

Heuristic Model of Housing Need

A heuristic model can aid somewhat in the delineation of hypotheses to be tested. As apparent from Figure IV, the current examination of housing needs is complex but the key explanatory variables identified by housing needs research are represented in accordance with the research and literature

FIGURE V
Heuristic Model of Variables Related to Housing Need



review represented in Figure V. Figure V includes direct relationships of independent variables within the dimensions of housing affordability and housing suitability. As well, the indirect relationships between the independent variables and the dependent variable of housing need becomes intelligible from the latter model for the ensuing empirical analysis.

The heuristic model in Figure V will also aid in the conceptualisation and testing of the relationship between the dimensions and variables to be examined. As can be seen from Figure V, housing need can be operationally defined in a manner which is theoretically linked to the socioeconomic variables of housing affordability and suitability. Socioeconomic status is important to note as it is operationally defined as a construct of the three variables

education, income, and occupation. Each of the variables may also include other external factors which may affect housing need but these external variables will not be measured as they are beyond the scope of the present study.

Research Hypotheses

The suppositions which guide the formation of the research hypothesis include a number of observable relationships from the literature review. First, lone parent families have been shown to earn less income than two parent families. Second, lone parent families headed by women have less income than lone parent families headed by men. Third, an overwhelming proportion of lone parent families headed by women are in a state of relative poverty. Fourth, lone parent families must use a greater proportion of their incomes on housing than two parent families. Fifth, lone parent families headed by women have diminished access to the labour employment market than lone parent families headed by men. Finally, lone parent families are more predisposed than two parent families to have housing needs which can be measured by housing affordability and suitability.

The research hypotheses which set the framework for analysis of the current study can be explicitly stated by the following:

a). the probability for housing need increases positively with increases in the measure of the family housing suitability;

b). the possibility of housing needs varies inversely and significantly by the number of adults in the family;

c). the extent of housing needs for the lone parent family varies directly with the gender of the lone parent;

d). the potential for housing need increases as the intensity and scope of housing affordability among lone parent families decreases;

e). the magnitude of housing need decreases as the socioeconomic status of the lone parent increases, and;

f). the variables of education, income, occupation, gender, and age are, in combination, significant determinants of lone parent housing needs as measured by housing suitability.

Obviously, other relationships may exist and become evident upon empirical analysis. Yet, in order to test the hypotheses, the postulates a) through f) will suffice in the current examination of housing need. As the model and hypotheses combine both empirical referents with theoretical conceptualisations in an approximation of reality, possibilities result for both pedagogic knowledge and public policy ramifications. Thus, the methodology of the current study must be addressed for the implementation of the empirical research.

CHAPTER THREE:
METHODOLOGY IN THE STUDY OF HOUSING NEED FOR
THE LONE PARENT FAMILY

3.1 INTRODUCTION

The measurement of housing need for the lone parent family may create methodological problems for both researchers and public policy makers alike. The accurate measurement of the socioeconomic variables which directly affect housing need for the lone parent family can become somewhat onerous when compared with other family types. These difficulties can be the result of numerous substantive qualitative differences between family types or from different techniques of empirical measurement.

The purpose of this chapter is to establish the methodological considerations and parameters for the empirical investigation of affordable and suitable housing conditions for the lone parent family. The chapter is organised into four separate and distinct sections. The first section defines the population of study in the investigation of the phenomenon underlying housing needs for the lone parent family. With this, a discussion of the usage of national census data to be included will be presented and evaluated in terms of the applicability of national data. The second section describes the sample of households which will provide

the basis for the empirical analysis. This will include both a discussion of the Winnipeg Area Study and the methodology utilised in the data collection for the 1981 through 1991 studies. As well, a brief discussion of the concatenation of the Winnipeg Area Study survey years will be presented. Then, the third section will discuss the operational definition of both the independent and dependent variables according to the heuristic model from Figure V for measuring housing need of the lone parent family. Finally, the fourth section defines the techniques which will be utilised to both empirically test the hypotheses in chapter two and evaluate housing need for the lone parent family. Therefore, this chapter will endeavour to establish the methodological framework for the empirical analysis of housing needs for the lone parent family found in chapter four.

3.2 POPULATION OF STUDY: WINNIPEG HOUSEHOLDS

Increasingly, lone parent families are finding it more difficult to acquire housing which is both affordable and suitable within major Canadian urban centres. In particular, it has been demonstrated that lone parent women are twice as likely to be undergoing excessively high housing costs and general housing affordability problems as are either two parent families or non-family households in Winnipeg. For example, Stevens and Fogg (1979) found in their study of lone parent housing affordability in Winnipeg that fifty-five percent (55%) of lone parent women were experiencing excessive housing costs. In comparison to the total population of Winnipeg, they noted that only eleven percent (11%) of two parent families and twenty-five percent (25%) of non-family households in their sample were under the same economic constraints (Stevens and Fogg, 1979: 84-85).

Although the research of Stevens and Fogg is somewhat dated, their selection of the urban area of Winnipeg as a population of study is pertinent to the current research. In order to measure the housing needs of the lone parent family, the urban area of Winnipeg will provide an appropriate and diverse, yet distinct population from which a sample will be selected. The population of Winnipeg shall be utilised within the current study and will facilitate an empirical test of the hypotheses found in chapter two.

The definition of the population for this study, as in any study, must merely follow two elementary guidelines for the determination of a sampling frame (Rea and Parker, 1992: 15). First, that the population must be clearly identified by the specification of certain set of common characteristics shared among each of the members within that group. That group can be constituted by individuals, households, communities, or even nations of peoples. Second, that a reasonably accurate enumeration of all the population members can be obtained so that a representative sample may be drawn from the finite population specified under the first guideline. If both guidelines can be sufficiently demonstrated to have been accomplished, it can be argued that an adequate representative sample has been generated to empirically test hypotheses such as those found within chapter two.

In order to accomplish the two guidelines in the definition of a population for study, the sampling and survey methodology of the Winnipeg Area Study will be employed within the current research (Grant, 1991). The Winnipeg Area Study has defined as its annual population of study the total number of households within the urban area of Winnipeg. The population was determined through the total annual index of households (dwelling units) listed in the tax assessment files of the previous year for the City of Winnipeg. The assessment list is assumed to be a complete listing for that year of all

existing households and residences within one percent in the urban area of Winnipeg. As the assessment list of households is maintained in an addressing database compiled by the Environmental Planning Office in the City of Winnipeg, an easily obtainable representative sample has been selected by the Winnipeg Area Study for each of the annual studies. One particular facet of notable importance is that nursing homes and temporary residences have been excluded from the definition of the population due to the transitory tenure of their residence.

The selection of the urban area Winnipeg as the population for study, and not the larger national population of all Canadian households available through either census data collected by Statistics Canada or other data collection sources, requires elaboration. The use of the urban centre of Winnipeg as a distinct population of study corresponds with the urban area geographical and spatial frame as defined within the data collection methodology employed by Statistics Canada. One category in which Statistics Canada separates census data collection into is the census metropolitan area which is defined as an 'urban area' for comparative research purposes (Statistics Canada, 1994a). The urban area designation for the population parameter will allow for comparison with both nationally collected data and data from other urban areas in Canada. As well, Statistics Canada determines the Consumer Price Index measures within urban

areas--one urban area measured is the City of Winnipeg (Statistics Canada, 1989a: 14). Furthermore, defining the urban area of Winnipeg as a population within the larger population of households in Canada will provide a means to determine the reliability of the sampling frame.

The larger census based data collection offer reliable statistical samples of the national population. As well, the census data allows trends over time to be examined. Yet, these census data may not provide too much detail. The Winnipeg Area Study can provide valuable detailed socioeconomic information about households and, in particular, lone parent families. Yet, Lero and Brockman (1993) have cautioned that a small scale study such as the Winnipeg Area Study may be fraught with methodological and substantial problems. Inadvertently, the Winnipeg Area Study may work to reinforce certain stereotypes about the lone parent family due to the limitations of sampling which are not found in the census. As well, the findings may not be amenable to complete extrapolation due to sampling procedures which may be difficult to reproduce or control as a result of the use of the secondary source for data analysis (Lero and Brockman, 1993: 91). In particular, the Winnipeg Area Study prevents the measure of housing adequacy within the current study.

3.3 SAMPLE SELECTION: THE WINNIPEG AREA STUDY, 1981-1991

The purpose of this section is the description, explanation, and discussion of the methodology utilised in obtaining a sample of lone parent households for the empirical analysis found in chapter four. In order to obtain a representative sample, the sample has been selected and surveyed from the population of households in the urban area of Winnipeg. The sample has been collected by the Winnipeg Area Study at the University of Manitoba for the years 1981, 1983, 1984, and 1986 throughout 1991 inclusively.³ The Winnipeg Area Study has implemented, conducted, and administered all aspects of the research process in each of the years and has continued to conduct similar population surveys in Winnipeg since 1991.

Each survey conducted over the period between 1981 and 1991 has focused on particular substantive issues. The substantive issues have included such diverse topics as perception and fear of crime, attitudes towards cigarette smoking, issues surrounding health care, and a multiplicity of other sociological topics far too broad to be covered here. As a result, the attitudinal and subjective nature of the responses within topics surveyed have varied dramatically from year to year. Yet, the essential socioeconomic datum for households, and the individuals within these households, have

³The Winnipeg Area Study did not conduct surveys in either the years of 1982 or 1985.

been collected throughout the history of the Winnipeg Area Study. As the Winnipeg Area Study is an annual survey, replication of the particular findings, such as those found within the current study, may be facilitated through consistent and continued measurement and evaluation of the socioeconomic variables over the upcoming years. Furthermore, as a number of Winnipeg Area Study survey years are included in the current study, some methodological elaboration is required to demonstrate the applicability of concatenating survey data from year to year. Therefore, it is necessary to review the general sampling methodology of the Winnipeg Area Study as it applies to the investigation and construction of a single data set sub-sample which will be utilised within the current study.

In order to combine the Winnipeg Area Study datum from the years 1981 to 1991, each of the variables from each survey year had to be concatenated into a single data file for the final analysis. Due to a limitation of computing resources, only variables pertinent to the current study were included in the final concatenated sample. This required ensuring that the variables which were re-coded measured the same phenomena within each of the Winnipeg Area Study years through a justifiably equivalent measurement technique. Although there do exist some slight grammatical changes to questions, each of the questions concatenated can be argued to measure the same phenomenon. In certain instances, some variables could not be

re-coded into equivalent measures and were thus excluded from the final generation of the concatenated sample database. The SPSS® release 5.0 (Statistical Package for the Social Sciences) computer software code utilised in the construction of the concatenated sample database can be found in its complete form within Appendix I (Concatenated Winnipeg Area Study Final Sample Code With Dictionary).

Consistent with the methodology implemented annually by the Winnipeg Area Study, each individual sample, and thus the final concatenated sample, can be argued to have been systematically and randomly drawn from the City of Winnipeg addressing database over the years 1981 to 1991 inclusive. Simple random samples (after stratification) of the sampling frame were used to determine the final sampling register for each of the respective Winnipeg Area Study years. Primary sampling frames consisting of approximately seven hundred and fifty households (n=750) from the urban area of Winnipeg were extracted from the respective register data bases for personal interview surveying in each sub-sample (the exception being the 1981 survey).

Secondary samples of approximately one hundred and fifty households (n=150) were also designated for each survey year sub-sample and these secondary lists were randomly ordered to be used as replacement for both households not contacted and those deemed ineligible. In order to be determined as eligible, the respondent had to be an individual who met the

criteria listed below. Substitution with another individual was not permitted except in the instance required to satisfy the stratification for the sample according to the designated gender of the respondent (see below).

The household was deemed to be ineligible if the research assistant subjectively determined that the individual initially contacted did not meet any one of three established criteria (Grant, 1991: 4). The first criteria was determined by the language of use by the prospective individual respondent. If the respondent had either limited or no working English language skills, the household was to be considered ineligible. As well, if the individual contacted was unable to physically respond to or understand the questions of the survey due to an impairment such as hearing, illness, or extreme old age, the household was regarded as ineligible due to the second criteria. Finally, in the instance where a designated household address was not an actual family residence, the household was deemed ineligible as a consequence of the third criteria utilised by the Winnipeg Area Study.

As well as respondent eligibility, there were two distinct criterion for consideration of a household as a successful contact. First, the individual originally contacted by the research assistant had to be eighteen years of age or older. Second, the individual contacted had to be a resident of that household in order to be considered as a

contacted household (Grant, 1991: 2). Non-contacts determined based on these two criterion and individuals deemed non-eligible through the above three criterion were replaced with households from the secondary sampling frame replacement lists.

A household was denoted to be a non-contact after at least eight (8) successive visits by the research assistant to the household without any contact with a resident (Grant, 1991: 4). Each succeeding visit was staggered by the research assistant to change the time of day and day of the week that the contact was attempted to accommodate different time usage patterns. The initial attempt at contact (re-coded as INITCALL, see Appendix II, Selected Variable Frequencies: Concatenated Winnipeg Area Study Codebook, 1981-1991) resulted in four hundred and thirty-two ($n=432$) successful contacts or nine percent (9.29%) of recorded contact attempts within the total concatenated sample file. Whereas, just over fifty percent (50.6%) of the successful interviews resulted on the first (31.9%) and second (18.7%) subsequent call backs by the research assistant. Each successive attempt at contact was recorded within each of the Winnipeg Area Study years (re-coded as CALLBK1 through CALLBK7, see Appendix II). The distribution of successful contacts can be observed in the presentation found within Table V.

Each household was designated a specific respondent code which was recorded in each Winnipeg Area Study year and has

TABLE V
 Winnipeg Area Study:
 Successful Interviews by Contact Attempt, 1981-1991

Contact Attempt	Successful Interview	Percent of Concatenated file
Initial Visit	432	9.3
First Call Back	1483	31.9
Second Call Back	871	18.7
Third Call Back	459	9.9
Fourth Call Back	279	6.0
Fifth Call Back	169	3.6
Sixth Call Back	107	2.3
Seventh Call Back	74	1.6

n = 4650, missing cases = 776.

been re-coded under the variable RESNUM in the final concatenated sample. The new variable SURVYEAR had to be constructed to represent the year in which the survey was conducted (see Appendix II). The new variable representing the survey year will allow for necessary weighting as a result of possible temporal differences between the years of the Winnipeg Area Study.

The final number of successful contacts and subsequent interviews through the years 1981 to 1991 is found within Table VI. As a result of ineligibles and non-contacts, the final concatenated Winnipeg Area Study 1981-1991 sample was determined to be four thousand six-hundred and fifty households (n=4650). Each of these households consented to

TABLE VI
Winnipeg Area Study:
Completed Interviews, 1981-1991

Winnipeg Area Study Year	Completed Interviews	Percent of Concatenated file
1981	336	7.2
1983	524	11.3
1984	573	12.3
1986	548	11.8
1987	581	12.5
1988	528	11.4
1989	521	11.2
1990	506	10.9
1991	533	11.5

n = 4650.

participate in the interviews. The interviews were conducted through a standardised personal interviewing technique specific to the Winnipeg Area Study (Grant, 1991). Although completion rates were not readily available for each year, the completion rate is assumed to be quite good for each of the Winnipeg Area Study survey years. For example, the completion rate in the 1991 Winnipeg Area Study was slightly over seventy percent (71.64%). Compared with the considerably lower response rates many private organisations achieve, several of which commonly have completion rates below fifty percent, the Winnipeg Area Study can be maintained to have demonstrated the ability to generate a respectable and representative response

rate as a result of the sampling frame determination methodology (Alwin, 1977: 135; Pearl and Fairley, 1985: 553; Goyder, 1987: 6, 41-44).

The contacts which resulted in a successful interview (n=4650) occurred between the months of January to June in the respective survey year. Ninety-four and one-half percent (94.5%) of the successful contacts occurred in the first three months of the year (see Appendix II). The month was recorded by the interviewer for each Winnipeg Area Study and was re-coded as variable INTMONTH in the concatenated final sample. The date was recorded by the research assistant and re-coded as INTDATE in the final concatenated sample.

The successful contacts made varied in time (the time of the interview was recorded and re-coded as INTTIME) from as early as 7:30 in the morning to as late as 23:45 in the evening--the modal interview occurred at 7:00 pm (mode=1900). The length of the interview was recorded (re-coded as INTLGTH) and ranged from very short interviews of only ten (min=10) minutes to substantially longer interviews of just under four hours (max=230 minutes). The mean interview length for the total concatenated final sample was just under fifty-five minutes ($\bar{x}=54.911$) with a standard deviation of approximately twenty-four minutes ($s^2=23.811$).

Finally, the gender of the interviewer was also recorded to determine the possible introduction and extent of interviewer bias (re-coded as INTGEND, see Appendix II). As

with all survey methodology, the potential of interviewer bias based on the gender, age, ethnicity, or even the regional accent of the interviewer existed (Rea and Parker, 1992: 91). Yet as noted above, the Winnipeg Area Study has sufficiently attempted to minimise the possibility of interviewer bias occurring through standardisation of the data collection conducted by the research assistant and facilitated by the required training of interviewers according to the Winnipeg Area Study's *Interviewer Handbook* (Grant, 1991: 3). Of the recorded gender of the interviewer (n=2113), a woman overwhelmingly (n=1639) conducted the interview with the respondent. Yet, repeated paired t-tests on a number of socioeconomic variables demonstrates no significant differences based on the interviewer gender. In part, this could be the result of simply only testing demographic and socioeconomic data for interviewer bias. Furthermore, Bradburn, Rips, and Shevell (1987) have noted that any notable variance which may result in a respondent answering such autobiographical questions would most likely be the result of insufficient respondent memory recollection which typically relies on 'fragmentary information' and mental inferences. Finally, Nachmias and Nachmias (1992: 228-229) have added that interviewer bias is predominantly the result of verbal and non-verbal cues possibly introduced by the interviewer when the survey methodology is standardised.

As the Winnipeg Area Study utilises the household as the primary sampling unit, the criterion of gender along with age and residency were introduced into the latter survey years for stratification of the sample. Each research assistant was given a predesignated respondent gender (re-coded as DESGEN) for each respective household (see Appendix II). If the person contacted by the research assistant was not of the specified gender (in the years with a predesignated respondent gender), the research assistant was instructed to request that an individual of the correct gender be selected for interview (Grant, 1991: 2). As would be the case with a number of lone parent (and non-family) households, the individual initially contacted was specified to be the respondent for the survey when there were no individuals above seventeen years of age for the specified gender residing within that household which could be used as a replacement.

The final concatenated sample distribution by family types is reproduced in Table VII. The total number of the lone parent family sub-sample is three hundred and eighty-six (n=386) respondents. As the lone parent family is central to the analysis found below, two parent families and extended families are shown in Table VII as a single category. Two parent families and extended families will be grouped together as a single category for the remainder of the current study for the sake of parsimony and simplicity. Approximately eight percent (8.35%) of families interviewed by the Winnipeg Area

TABLE VII
Winnipeg Area Study:
Distribution of Family Types, 1981-1991

<u>Family Type</u>			
Single Individuals	Lone Parent Families with Children	Families without Children	Other Families with Children
1525	386	1329	1383

n = 4623.

Study between 1981 and 1991 were lone parent families with children. It is important to note that this percentage is somewhat lower than the national calculations and the census data of 1991 collected for the urban area of Winnipeg (Statistics Canada, 1993a).

The number of lone parent households identified within the national census population of family households was just over nine hundred thousand families (n=905395) which represented twelve and one-half percent (12.50%) of the national population in 1991 (Statistics Canada, 1993a: 220). As well, the 1991 census data indicate that the number of people within lone parent households in the Province of Manitoba to have been over thirty five thousand (n=35685) which identified twelve and one-half percent (12.62%) of the population, roughly equal to the national distribution for all households (Statistics Canada, 1993a: 227). Lone parent households in the City of Winnipeg numbered over twenty four thousand (n=24470) and can be considered to have a moderately

higher level than the Province or Canada as a whole, representing over fourteen percent (14.38%) of individuals within the urban population in 1991 (Statistics Canada, 1993a: 257).

Although the differences between the Winnipeg Area Study and Statistics Canada census figures for the urban area of Winnipeg are real and substantial, it is maintained that the concatenated sample will sufficiently provide a representative sample of lone parent families in Winnipeg for the required analysis. The lower proportion of lone parent families in the Winnipeg Area Study would be the likely result of not stratifying the sample by family type. This problem can be common and typical in the usage of secondary data sources for an empirical investigation such as that for the current study (Nachmias and Nachmias, 1992: 295). Furthermore, any substantial and significant differences of socioeconomic measures between the Winnipeg Area Study and nationally collected census data should become apparent within the next section pertaining to the measurement of the dependent and independent variables.

3.4 MEASUREMENT OF THE DEPENDENT AND INDEPENDENT VARIABLES

The purpose of this section is to delineate how each of the dependent and independent variables may be operationally measured into functionally valid variables and constructs. The delineation of the variables to be utilised within the study of housing needs for the lone parent family requires some elaboration. As the empirical measures of the variables and resulting constructs from the Winnipeg Area Study are measured over the period from 1981 to 1991, each variable must be presented and explained in terms of its ability to measure that which it purports to measure (Nachmias and Nachmias, 1992: 158). With this discussion of validity, each variable will be briefly described with respect to the measured frequencies, distributions, and variances which have resulted from the final concatenated Winnipeg Area Study sample. Furthermore, each variable will be examined specifically for the lone parent family sub-sample and will be compared with the measures from the complete Winnipeg Area Study concatenated final sample and 1991 census data where appropriate. Finally, to facilitate the testing of the hypotheses found in chapter two, variables which require either weighting or scaling will be noted and the appropriate techniques will be discussed.

As evident from the construction of the concatenated Winnipeg Area Study sample, the numerous variables utilised and measured from 1981 to 1991 are quite complex. In essence,

the easiest method to operationally outline each variable is to systematically delineate each in turn and how the respective variable was measured within the Winnipeg Area Study surveys. This will aid in demonstrating how each variable can contribute to the analysis of housing needs for the lone parent family. Each of the variables and constructs found in Figures I to IV will become conceptually evident from the following discussion of the dependent variables and the constructs of housing suitability. Moreover, elaboration of the independent variables and the construct of housing affordability, as found in the heuristic model of housing need (above), will follow to finalise the framework for the subsequent analyses organised in the next section.

Dependent Variables

In the above theoretical discussion pertaining to housing suitability within chapter two, the measurement of housing needs was demonstrated to combine the concepts of housing suitability with housing affordability in the model representing housing need for the lone parent family. Housing suitability can adequately serve as the construct which represents the dependent variables in the measurement of housing need for the lone parent family (Figure V). The final concatenated Winnipeg Area Study sample can provide a sub-sample from which the dependent variables can be sufficiently

measured for the lone parent family. The constituent variables of the housing suitability construct need to be briefly examined to demonstrate the development of the construct which will measure housing needs for the lone parent family.

In essence, the suitability of housing can be defined as a construct which evaluates and measures the number of rooms of the respective household. The number of rooms is weighted by the number of family members, or residents of the household, to produce an indication of housing suitability. The resulting index of housing suitability must include, as noted in chapter two, the familial relationships that exist between members of the household. For example, a two parent family without children would only require one bedroom to have achieved a level of acceptable housing suitability. As a result, each value derived must be further scaled to accommodate the room requirements which arise from familial relationships within each respondent household.

The number of rooms was re-coded as NUMROOM in the final concatenated Winnipeg Area Study sample file (see Appendix II). In each of the Winnipeg Area Study years, the research assistant implementing the interview queried of each respondent:

"How many rooms do you have here, including basement development, but not counting hallways and bathrooms?"

The research assistant was required to record the total number of rooms with either a whole number or indicate that no response (recorded as 99) was given by the respondent. The number of rooms ranged from one (1) room to twenty-one (21) rooms. Of the total sample, the mean and median number of rooms for all family types were found to be six rooms per household ($\bar{x}=5.937$, median=6).

The mean number of rooms for all family types is slightly below the national average determined in the 1991 census to be just over six rooms ($\mu=6.1$) per household (Statistics Canada, 1993a: 37). Yet, the mean number of rooms for the concatenated final sample is slightly above the mean for Manitoba ($\mu=5.8$) and Winnipeg ($\mu=5.7$) and would appear to be a representative sample on the whole (Statistics Canada, 1993a: 41, 63). Finally, the variation was found to be fairly representative of the census distributions with a standard deviation was just over two rooms ($s^2=2.290$) for all the households in the sample.

The number of rooms within the household has also been specifically measured for the lone parent family through the Winnipeg Area Study and compiled within the concatenated final sample. The mean number of rooms for the lone parent family

was found to be scarcely over six rooms ($\bar{x}=6.064$) per household with a standard deviation of two rooms ($s^2=2.079$). This is slightly above, albeit representative, of the mean number of rooms for the lone parent families in Canada ($\mu=5.9$), Manitoba ($\mu=5.8$), and Winnipeg ($\mu=5.8$) respectively (Statistics Canada, 1993a: 220, 227, 257).

Although the number of rooms is an important measure and indication of suitable housing for the lone parent family, the measure necessitates weighting by the number of family members (individuals in the household) and the familial relationships between these members to more accurately reflect housing suitability. The number of individuals within the household was determined by a combination of two questions and substantiated through cross-classification with a series of subsequent questions. Ultimately, this will serve to improve the reliability of the measurement for the dependent variables of the housing suitability construct (Nachmias and Nachmias, 1992: 163).

The first question solicited the number of adults (recorded as ADULTS) within the household:

"Including yourself, how many adults eighteen and over are presently living here, related to you or not?"

The question was intended to elicit responses which would measure every adult in the household and indicate the presence of an extended family household composition or of the existence of renters or other tenants within that household. The number of adults in the household ranged from one (1) to ten (10) individuals (see Appendix II). It must be noted that this measure does include adult children of the respondent (or conversely the respondent may have even been an adult child within the family).

The second aspect of household composition queried the number of children in the family whom were under the age of eighteen (re-coded as CHLDRN). The interviewer asked the following question of the respondent:

"How many people under eighteen are presently living here?"

Analogous to the question pertaining to the number of adults, this question was intended to measure the number of children in the family and ascertain the existence of any extended familial relations or tenants within the household.

In the Winnipeg Area Study concatenated final sample, the number of children in the household ranged from no children (0) to ten (10) children (see Appendix II). Of four thousand six hundred and thirty-nine (n=4639) valid cases, there were two thousand eight hundred and sixty-six (n=2866) families

without children. The average number of children was less than one child ($\bar{x}=0.696$) for all households. A more practical measure would be to exclude families without children. As a result, the mean number of children in families with children (re-coded as CHLD2 within Appendix II) was just under two ($\bar{x}=1.822$) children with the modal number of children equivalent to one occurring in seven hundred and forty households ($n=740$). The distribution of children by family type for those families with children is reproduced in Table VIII. To determine if there exists a statistically significant difference by family type, the chi-square test can be applied to the above distributions with the null hypothesis that there is no difference exhibited by family type (Nachmias and Nachmias, 1992: 464-467). As a result, the null hypothesis must be rejected as the chi-square value ($\chi^2=73.5396$), with four degrees of freedom ($df=4$), indicates that the probability of no difference is well within the critical region of rejection for the respective level of significance ($p<0.00000$).

As noted above, there exists a means to empirically validate the measurement of family structure within each household. The two questions directly pertaining to the number of adults and number of children respectively did not differentiate nor discriminate between family and non-family residents of the household. As a result of this Winnipeg Area Study methodology, it was necessary to re-code the variables

TABLE VIII
 Winnipeg Area Study:
 Family Types by Children, 1981-1991
 (Percentages)

Number of Children	Lone Parent Families	Other Families	All Families
1	229 (59.33)	508 (36.73)	737 (41.66)
2	107 (27.72)	617 (44.61)	724 (40.93)
3	31 (8.03)	200 (14.46)	231 (13.06)
4	10 (2.59)	46 (3.33)	56 (3.17)
≥ 5	9 (2.33)	12 (0.87)	21 (1.19)
n =	386	1383	1769

which ascertained the familial relationship of each household member to each other household member. Each member of the household was recorded by their relationship to the respondent. The variables were re-coded as RELMEM2 to RELMEM9 for the second through ninth household member inclusively within the final concatenated sample. In order to ascertain the familial relationship of each household member to the respondent, the respondent was queried:

"Now I would like you to list the members of this household..."

The research assistant was directed to query the age and sex of each subsequent member as well as their relationship to the

respondent. The responses were recorded by the following valid response categories:

Respondent	01
Spouse, Companion, or Partner	02
Son	03
Daughter	04
Mother	05
Father	06
Sibling	07
Other Relative	08
Friend (non-family member)	09
Other (non-family member)	10

It is important to note that foster children were excluded from the valid children categories and were required to be recorded as other (category 10) household members.

As the familial relationship of each household member was identified through the above method, the cases where non-familial residents were present in the household can be excluded from the final analysis. Moreover, the presence of non-familial and extended familial relationships have been included within the category of other family types to facilitate the analysis. In fact, the above separation of family types and the other variables discussed thus far have been accordingly adjusted for the existence of non-familial household members and removed from the sample of lone parent families. Twenty seven (n=27) households which may indeed have been lone parent families were rejected from the subsample of lone parent families due to the presence of other non-familial and non-conjugal adults.

After the household members have been determined and non-familial cases removed, the number of rooms must be weighted by the household composition to derive a scaled index of housing suitability. In effect, the weighted result can be defined as the household density. Yet, the weighted value of housing suitability is not quite a simple proportional value of the family size divided by the number of rooms within each household. The relationships between members identified above must again be utilised to account for the distinctions between non-familial household members and family members as noted above. As a result, a scaled measure of housing suitability can be derived for usage within the empirical analyses according to the family size, familial relationships, and number of rooms within the household.

Each individual within the household required scaling according to their relationship with the respondent and with the other members of the respective family. For example, a household with two adults in the family required separation and distinction between the conjugal adults and those which were offspring. To distinguish between the relationships of familial members, each case was selected to have need of one (1) additional bedroom where a subsequent adult member within variables RELMEM2 to RELMEM9 was identified as an offspring. Following this, each conjugal relationship within the household was subtracted from the number of adults to derive a weighted measure to more accurately reflect the housing

suitability of that particular household. As a result, two conjugal adults would only require a single bedroom whereas every adult child would require separate rooms to meet housing suitability requirements.

After the housing density was calculated, each value recorded for the number of rooms was reduced by two rooms (2) for each case based on the assumption that each family requires a room for food preparation and consumption and a room for common activities for the family commonly referred to as a 'living room' or 'family room.'

Although many such rooms can have dual usages, it can be postulated that the division between those families determined to reside within suitable housing and those whom do not would not be affected. Even though a family may possibly be converting rooms into bedrooms at night, families that do so will still have identifiable problems meeting an adequate and standardised level of housing suitability and would likely still demonstrate absolute housing suitability needs. Furthermore, the measure proposed will still accurately identify those individuals and families which can be defined as having absolute need due to unsuitable housing. As Statistics Canada employs similar methods, such a definition will suffice and facilitate comparison between the data collected in the Winnipeg Area Study and that of the 1991 Canada Census data. In effect, a measure of the number of

bedrooms was created from the Winnipeg Area Study concatenated final sample.

The following formula within Equation I has been adopted to produce a weighted index for the scaled measure of housing suitability for the determination of the dependent variable in the analysis of housing need for the lone parent family:

EQUATION I
Determination of Housing Suitability

$$HS_a = \frac{R_i - R_c}{C_i + (A_i - \dot{A}_i)}$$

(I)

Where HS_a = Index of housing suitability;
and, R_i = The number of rooms in the household;
 R_c = The subtraction of common rooms (constant of 2);
 C_i = The number of children in the household;
 A_i = The number of adults in the household;
 \dot{A}_i = The number of conjugal relationships in the household.

It should be noted that, to prevent errors occurring from subtraction resulting in a value of zero (0), each calculation was repetitiously measured through an iterative process.

The index, which has resulted from the application of Equation I, measures housing suitability and has been applied to the Winnipeg Area Study concatenated final sample. The result of applying Equation I to measure housing suitability is an indexed value which could range from a low of negative one (-1.0) to an infinite positive value. The distribution of values which results is asymmetrical with a positively skewed

dispersion from the intercept. A value of less than or equal to one (≤ 1.0) indicates unsuitable housing and can be defined as a household with absolute need. Whereas, a measure of the index greater than one (> 1.0) may indicate a housing suitability problem but would require more refinement of the measurement. The future refinement of the housing suitability index would be conceivable through more precise qualitative measures and direct surveying to assess the specific usages for each room within the given household. Yet, the intention of creating an index for the measurement of housing suitability (found in Equation I), which will be applied within the empirical analyses found in the ensuing chapter, can be argued to have been successful through the scaling measures discussed above.

The results of the scaled and weighted measure of housing suitability have been re-coded in the Winnipeg Area Study concatenated final sample as HHSUIT for all households. The mean and standard deviation measures of housing suitability were calculated through the application of the following formulas:

EQUATION II-III
Determination of Housing Suitability Measures

$$HS_{\bar{x}} = \frac{\sum \left(\frac{R_i - R_c}{C_i + (A_i - \bar{A}_i)} \right)}{n}$$

(II)

$$HS_s = \sqrt{\frac{\sum \left(\left(\frac{R_i - R_c}{C_i + (A_i - \bar{A}_i)} \right) - HS_{\bar{x}} \right)^2}{n - 1}}$$

(III)

Where $HS_{\bar{x}}$ = Mean value of housing suitability;
 and, HS_s = Variance of housing suitability;
 R_i = The number of rooms in the household;
 R_c = The subtraction of common rooms (constant of 2);
 C_i = The number of children in the household;
 A_i = The number of adults in the household;
 \bar{A}_i = The number of conjugal relationships in the household.

From Table IX, it can be observed that the measures of the mean and standard deviation both varied considerably by the family type. Lone parent families (n=386) had a mean indexed housing suitability measure of under two ($\bar{x}=1.6483$) with a standard deviation of just under one ($s^2=0.9145$). The measures of central tendency and dispersion are important to note for two specific reasons.

First, the measures within the group of lone parent families demonstrate meaningful findings. Although the mean was found to be well above the postulated level for absolute need, the standard deviation indicates that there are a

TABLE IX
 Winnipeg Area Study:
 Housing Suitability by Family Types, 1981-1991

Family Type	Mean	Standard Deviation	Cases
Lone Parent with Children	1.6483	0.9145	386
Two Parents with Children	1.9072	0.8772	1217
One Adult, No Children	2.6568	2.2418	1311
Two Adults, No Children	4.0945	1.9588	1174
All Households	2.7669	1.9732	4088

considerable number of lone parent families which can be defined as having absolute housing suitability need. In fact, the number of lone parent families which scored one or less was almost one third (n=123) of all lone parent families within the total concatenated final sample. As well, while it would be expected that only two and one-half percent (n=9) of lone parent families would have values above two standard deviations ($\bar{x}+2s^2=3.4760$), the number of lone parent families totalled sixteen (n=16). As such, the measures indicate an meaningful positively skewed distribution which require further investigation such as that found within chapter four.

As well as the important findings found within the group of lone parent families, it is also interesting to note the differences evident between distributions of the different family types. It is evident from Table IX that there exist substantial differences between the calculated group means.

In particular, the values obtained for families without children would ultimately raise questions pertaining to the allocation of housing resources. However, the discussion of an equitable allocation of housing resources is beyond the scope of the present study. Yet, a test of significance to ascertain if the means are indeed statistically different can be concluded through the use of an analysis of variance measure. The null hypothesis that no difference between group means exist can be sufficiently tested through an analysis of variance.

The analysis of variance was applied to determine the difference between the group means and demonstrated that the value for the F-statistic ($F=370.8337$), sum of squares ($SS=3396.3302$), and mean square ($\bar{x}^2=1132.1101$) with three degrees of freedom ($df=3$) are substantial. In fact, the values would indicate that the null hypothesis must be rejected and it must be accepted that the housing suitability means are not the same between family types with a high level of probability ($p<0.0000$). As a result, hypothesis a) specified within chapter two above can be accepted due to the rejection of the null hypothesis.

Furthermore, the strength of the measurement between variables can be assessed, described and tested through the use of the eta-squared measure of association. Similar to the Pearson's correlation coefficient measure of association, the eta (η) value can be calculated in terms of the correlational

relationship manifest between variables (Kirk, 1990: 176). Moreover, as the relationship approaches a linear one, the eta-squared value will approximate the r-squared value (Kirk, 1990: 177). The eta correlational ratio value ($\eta^2=0.4653$) was determined to be slightly higher than the correlation coefficient ($r=0.4455$). Similarly, the values of eta-squared ($\eta^2=0.2165$) and r-squared ($r^2=0.1984$) demonstrate the explanatory strength of the relationship between the family type and the measure of housing suitability. As the value for eta-squared can be maintained to be fairly meaningful in demonstrating differences between housing suitability for each of the family types, there is a worthwhile explanatory value in maintaining the measure of housing suitability.

Juxtaposed to the quantification of housing suitability, the derived scale can be re-collapsed into an ordinal measure which will facilitate a simple contingency table analysis of housing suitability classification. In order to collapse the scale into four meaningful categories, the above references to purposeful housing suitability distinctions must be applied. First, those families which have been denoted as having absolute housing suitability need will be aggregated into the category of 'absolute need.' This will be accomplished by including all derived housing suitability values of less than or equal to one (absolute need ≤ 1). The second category can be classified as having 'marginal need' and will encompass all the households which have calculated housing suitability

measures of greater than one and less than or equal to two (marginal need $>1, \leq 2$). The second category will include those families which demonstrate subjective, but not demonstrable, housing suitability need. The third category will indicate those families measured with adequate housing suitability levels and will be denoted as 'no need.' These families will be indicated by the calculated housing suitability values greater than two and less than or equal to four (no need $>2, \leq 4$). Finally, the fourth category will group those families which have an excessive measure of housing suitability. That is, those families with an abundance of rooms per individual will be grouped within the category of 'affluent.' This group will include the derived housing suitability values which are equal to or greater than four (affluent ≥ 4).

As a result of this categorical design of housing suitability, the distribution of lone parent families with children and all families can be observed within Table X. Due to the above classification which resembles the distribution of interval values, each category can be assumed to be representative of the housing suitability for the respective family type. As the theoretical discussion within chapter two noted that families with children would more likely experience housing suitability problems than those families without children, a chi-square test can be undertaken to determine if there is no difference by family type. The null hypothesis of

TABLE X
Winnipeg Area Study:
Housing Suitability Grouped by Family Types, 1981-1991
(Percentages)

Level of Housing Need	Lone Parent w/child	Other Families w/child	One Adult no child	Other Families no child	All Families
Absolute Need	123 (37.39)	232 (19.06)	475 (36.23)	93 (7.92)	923 (22.90)
Marginal Need	133 (40.43)	615 (50.53)	249 (18.99)	156 (13.29)	1153 (28.60)
No Need	69 (20.97)	349 (28.68)	353 (26.93)	464 (39.52)	1235 (30.64)
Affluent	4 (1.22)	21 (1.73)	234 (17.85)	461 (39.27)	720 (17.86)
n =	329	1217	1311	1174	4031

Missing cases = 569.

no difference by family type must be rejected as the chi-square value ($\chi^2=1191.404$), with nine degrees of freedom ($df=9$), indicates that the probability of no difference is well within the critical region for rejection ($p<0.00000$). In effect, hypothesis b) can be accepted due to rejection of the null hypothesis.

As the evaluation and operational definition of the dependent variables can now be considered to be complete, the discussion must now turn to the evaluation of the independent variables which will be utilised within the analyses and how they may be operationally measured in the analysis of housing need for the lone parent family.

Independent Variables

Housing affordability can be defined as a construct of variables which may be delineated in the current study as the independent variable in an attempt to explain housing need for the lone parent family. The construct of housing affordability includes the socioeconomic variables which are direct measures of the primary indicators of housing need for the lone parent family and include the education, income, occupation, gender, and age of the respondent. Ultimately, the measurement of housing affordability relies on the operational definition, application, and measurement of each socioeconomic variable defined below for development of an appropriate method to succinctly analyse housing needs for the lone parent family.

While each of the independent variables were measured for the respondent, it can be maintained that these variables reflect household measures for the lone parent family. In the case where two parent and extended families were identified, the variables may not be indicative of the socioeconomic conditions for the total household. For example, a research assistant may have interviewed a household respondent concerning personal income but a more representative and accurate measurement would be the total household income. Although there may exist a number of methodological barriers due to the survey implementation based on the family composition, each problem which is evident will be discussed

within the delineation of the respective variable. The first three independent variables to be discussed can be essentially defined as constituting the socioeconomic status of the respondent and include the education, income, and occupation of the respondent.

The highest level of education that each respondent had obtained was recorded in all of the Winnipeg Area Study surveys and was re-coded as REDLVL within the concatenated final sample (see Appendix II). The respondent was given a prepared paper educational scale to review and was asked to disclose their highest level of education through the following question:

"Looking at Scale [scale number], what is the highest level of education that you have completed?"

The paper educational scale was added in the 1990 Winnipeg Area Study. Prior to the 1990 Winnipeg Area Study, the respondent was only queried:

"What is your highest level of education?"

In the latter educational question, the research assistant was instructed to probe the respondent to ensure the highest level of education was recorded for the respondent. For example,

when a respondent identified completed high school as their highest level of education, the research assistant was to determine if they had partially completed any other post-secondary education.

In the interviews which utilised the prepared paper educational scale, the respondent was instructed to indicate the number which corresponded to their highest level of education from the following scale:

No Schooling	01
Elementary School Incomplete	02
Elementary School Complete	03
Junior High School Incomplete	04
Junior High School Complete	05
High School Incomplete	06
High School Complete	07
Non-University Incomplete	08
Non-University Complete	09
University Incomplete	10
Diploma/Certificate	11
Bachelor's Degree	12
Medical Degree	13
Master's Degree	14
Doctorate	15

In the earlier Winnipeg Area Study surveys, the research assistant recorded the verbal responses using the same response categories without the prepared paper educational scale.

It is important to note that the response category of high school complete (07) included completion of the general education degree. Moreover, the response categories of non-university (08 and 09) included post-secondary training from such educational sources as vocational, technical, and nursing schools. Furthermore, the response category of

diploma/certificate (11) included training such as that required for hygienists. Finally, the response category of medical degree (13) included such training as would be required by a veterinarian, general practitioner, or a dentist.

The highest level of education for the respondent varied considerably. Of the total concatenated final sample, four thousand six hundred and sixteen (n=4616) valid responses were recorded for the respondent. The modal response category for the respondent was found to be the high school completed (07) category: one thousand and thirty-six (n=1036) respondents had indicated that they were high school graduates. Finally, the respondent had indicated responses ranging from no schooling (01) to a university granted doctorate degree (15). The frequency distributions for the respondent are reproduced within Appendix II.

As well as measuring the educational level by the above method, the Winnipeg Area Study also measured educational level through determining the number of years schooling each respondent had completed. It is assumed that the second educational question had a two-fold methodological purpose. First, that the educational level of the respondent could be quantified as an interval level measure which could be correlated with the categorical data obtained through the highest level of education question. Second, that a measure to correlate the years of schooling with the educational level

could be readily available to test for any discrepancies between the two measures of educational level and to facilitate educational analysis with other selected variables from the Winnipeg Area Study surveys.

In order to ascertain the number of years of schooling, the research assistant solicited a response from the respondent to the following question:

"In total, how many years of schooling do you have? This includes total of grade school, high school, vocational, technical, and university."

This question was designed to elicit a response for the total number of years for which formal educational training was received by each respondent. The responses were re-coded in the concatenated final sample as RYRSCHL.

The mean number of years schooling of the respondent was just over twelve years ($\bar{x}=12.670$) with a standard deviation of just over three and one half years ($s^2=3.678$). The number of valid cases within the total Winnipeg Area Study concatenated final sample was found to be one thousand eight hundred and ninety two ($n=1892$).

As with the measure of eta above, a measure of the correlational ratio can be derived to determine the degree of association between the measure of highest educational level and the number of years schooling. As would be expected, the

highest level of education and number of years schooling for the respondent were found to be highly correlated ($r=0.8689$). To ensure the predicative ability of the highest level of education, an eta-squared measure can be obtained as an indicator for the level of causation the number of years schooling has upon the highest level of education. The eta-squared value has been derived for the respondent ($\eta^2=0.7550$) which indicates a very high evidence of predictive ability. As a result of the high correlation and eta-squared values found between the highest level of education and the number of years schooling for the respondent, the highest level of education will be utilised in the analysis found within chapter four. In fact, using the former variable of highest level of education to measure education corresponds to categories of data collection used by Statistics Canada within the 1991 census.

In order to define the highest level of education into a more parsimonious measure similar to that used by Statistics Canada, the highest educational level response category can be collapsed and re-coded into three meaningful classifiable distinctions. This was achieved by grouping the valid responses into the three grouped variables of 'less than high school complete' (1), 'high school complete' (2), and 'post-secondary education' (3). First, the category of less than high school complete included the Winnipeg Area Study response values of 'no schooling' (1), 'elementary school incomplete'

(2), 'elementary school complete' (3), 'junior high school incomplete' (4), 'junior high school complete' (5), and 'high school incomplete' (6). Second, the category of high school complete included the response values 'high school complete' (7), 'non-university incomplete' (8), and 'university incomplete' (10). Finally, the category of post secondary education included 'non-university complete' (9), 'university complete' (11), 'bachelor's degree' (12), 'medical degree' (13), 'master's degree' (14), and 'doctorate' (15). The new variable was re-coded as EDUC within the concatenated final sample (see Appendix II).

As a result of the new classification scheme, the frequency distributions of respondent educational level for each family type are presented in Table XI. It is interesting to note that of the families with less than high school complete, the lone parent family (34.46%) has proportionally more cases evident in the lower educational category than the two parent family (24.16%). Conversely, the two parent family (36.46%) was more likely to have a post-secondary education represented by the respondent than the lone parent family (27.98%). With a null hypothesis that there are no observable differences between family types and level of education, a chi-square test can be undertaken to determine if there is any discriminating differences between the expected and actual frequency distributions. In fact, the chi-square test for difference of association between the observed and expected

TABLE XI
Winnipeg Area Study:
Respondent Educational Level, 1981-1991
(Percentages)

Family Type	Less than high school complete	High school complete	Post- secondary education	Cases (n)
Lone parent family	133 (34.46)	145 (37.56)	108 (27.98)	386
Two parent family	332 (24.16)	541 (39.37)	501 (36.46)	1374
One adult, no children	457 (30.17)	598 (39.47)	460 (30.36)	1515
Two adults, no children	459 (34.88)	467 (35.49)	390 (29.64)	1316
Cases (n)	1381 (30.08)	1751 (39.14)	1459 (31.78)	4591

Missing cases = 59.

frequencies results in a value ($\chi^2=46.34040$), with six degrees of freedom ($df=6$), which indicates the null hypothesis of no difference must be rejected due to a fairly high level of statistical probability ($p<0.00000$).

It should be noted that the two parent family and two adults with no children are represented solely by the respondent within the Winnipeg Area Study. Although one adult is not included in the examination of education in the two parent family structure, it can be argued that the measurements are still valid inasmuch as they provide categorical data on the sample and are amenable to comparison with data collected by Statistics Canada. In fact, Statistics Canada regularly publishes data which indicate the educational

TABLE XII
 Family Type by Educational Level
 Winnipeg, Manitoba, and Canada, 1991
 (Percentages)

Family Type	Level of Education	Winnipeg Area Study*	Manitoba 1991	Canada 1991
Lone parent family	<HS	133 (34.46)	17430 (46.66)	401170 (42.07)
	HS	145 (37.56)	8365 (22.39)	235995 (24.75)
	PS	108 (27.98)	11560 (30.95)	316480 (33.19)
total (n)		386	37355	953645
-women headed	<HS	112 (37.33)	14035 (46.10)	331845 (42.09)
	HS	100 (33.33)	7125 (23.40)	203050 (25.76)
	PS	88 (29.33)	9285 (30.50)	253495 (32.15)
total (n)		300	30445	788390
-men headed	<HS	21 (24.42)	3395 (49.13)	69320 (41.95)
	HS	45 (52.33)	1245 (18.02)	32935 (19.93)
	PS	20 (23.26)	2270 (32.85)	62980 (38.12)
total (n)		86	6910	165235
Two parent family	<HS	332 (24.16)	99435 (40.01)	2250310 (35.15)
	HS	541 (39.37)	61405 (24.71)	1785155 (27.88)
	PS	501 (36.46)	87710 (35.29)	2366620 (36.97)
total (n)		1374	248550	6402085
Total All Families		1760	285905	7355730
Legend:	<HS	Less than high school complete.		
	HS	High school complete.		
	PS	Post-secondary education.		

Source: Statistics Canada (1993b).

- Winnipeg Area Study figures derived from the 1981-1991 concatenated final sample.

level of the family type by household head. Admittedly, this methodology may cause problems for analyses of two parent families but, as the analyses within chapter four pertain to the lone parent family, there is little cause for concern due to measurement discrepancies. In fact, as is apparent from Table XII, the Statistics Canada (1993b) distribution of

highest educational levels by family type provides an abundance of empirical data suitable for effective comparative purposes.

As with the highest educational level by family types within the Winnipeg Area Study concatenated final sample, the differences between the expected frequencies and the observed frequencies within Table XII can be statistically tested through the chi-square measure. In particular, there are four distinct relational observations which must be addressed as they relate to the application of educational level within the current study. The four relationships become prevalent between different family types by educational level for the areas of Winnipeg, Manitoba, and Canada.

First, it is apparent that Manitoba has in all categories proportionally more individuals with a lower highest level of education than the population of Canada as a whole. As well, a second observation must indicate that in Winnipeg, relatively more people have high school completed than in either Manitoba or Canada. With this, Winnipeg has less individuals in the category of incomplete high school than the Province or Nation as a whole. Although these two relationships between the variables of education and urbanisation are beyond the scope of the current study, suffice it say that the relationships have been addressed in other discussions of urbanisation directly effecting educational and social change (Driedger, 1991). The third and

fourth significant relationships of particular importance to be noted here concern the educational levels of lone parent families.

The third relationship which becomes evident is that lone parent families have achieved lower highest levels of education than that of two parent families in both Manitoba and Canada. Furthermore, the association which is of primary importance is the predominant differences between the educational levels of lone parent families headed by men and women. In all three demographic regions, men are more likely to have either a lower or higher education than women. Conversely in all three regions women are more likely to be high school graduates than men. To ensure that the above four visible differences are indeed significant variations, a chi-square test has been applied to test the null hypothesis that there is no difference between family types. After calculating the expected and observed frequencies, it was determined that the resulting chi-square value ($\chi^2=3412.8240$), with sixteen degrees of freedom ($df=16$), indicates that the null hypothesis of no difference must be rejected due to a very high level of probability ($p<0.00000$). As the relationships described above in Table XII have had the variable of gender added for increased explanation, further investigation will be undertaken within chapter four with the usage of a more appropriate method of analysis.

The variables of personal income and household income were measured in each of the Winnipeg Area Study surveys and re-coded within the concatenated final sample as PINCOME and HINCOME respectively. To ascertain the total household income, each research assistant was required to query of the respondent:

"Looking at Scale [scale number], please tell me which number comes closest to the total income for this past year, before tax and deductions, of all members living in this household?"

After determining and recording the household income for the respondent, the research assistant proceeded to discern the personal income of the respondent by asking the following question:

"Still looking at Scale [scale number], which number comes closest to your total individual income for this past year?"

In the instance of one person households, the interviewer was instructed to not read the latter question but rather simply record the response from the first question for the second. Both questions were recorded by the research assistant

utilising the same categorised income scale for the given Winnipeg Area Study survey year.

In each of the Winnipeg Study years, a categorised income scale was prepared prior to the survey implementation. Yet, the scale has changed dramatically over the period from 1981 to 1991. On the most part, these changes have reflected inflationary trends. As a result, the scales utilised require two specific modifications to be amenable for usage within the concatenated final sample for the current study.

First, the original income scale designed for each of the Winnipeg Area Study survey years was based on an ordinal level categorisation. The range of the response value categories varied within each of the years and required revision to be applicable for the concatenated final sample. The lowest income response value category in each of the Winnipeg Area Study surveys designated those individuals and households with less than six thousand dollars annual income (<\$6000). Each subsequent ordinal income response category, somewhat surprisingly, had intervals which were comparatively equivalent among all the Winnipeg Area Study years. The only exception to the parallel categorical response values was the breadth and lower limit of the final income response category on each of the survey years.

The final response category value in each Winnipeg Area Study encompassed all the household and personal income measures above a certain level and the resulting income scale

varied somewhat over the survey years. For example, the 1991 Winnipeg Area Study had the category '\$100,000+' which would include personal and household incomes both modestly above the interval minimum to any infinite income value. Whereas, the maximum open-ended income response value in the 1981 Winnipeg Area Study was '\$50,000+.'

In order to accommodate these different maximum response value categories and to transform the data into interval level measures appropriate for the analysis of housing needs for the lone parent family, a few necessary procedures were undertaken. First, the two categories encompassing the 'under \$6000' category and the final open ended maximum category were excluded as valid responses from the creation of the interval level response measures. Although a re-coding of the low income response category value into an interval level measure could have been assumed to be relatively representative, the re-coding of the high category could not. Yet, the former response category would be difficult to convert to an interval level measure of valid income responses as the number of individuals whom responded with no income was only differentiated from respondents with marginal incomes in a few of the survey years. Conversion of the former response value category would undoubtedly result in a biased measurement of the income distribution at the lower levels for both the variables household income and personal income. Moreover, as each of the two respective response categories represent those

values which can be defined as constituting an outlier on the income distribution, the extreme values at both the low and high ends of valid responses can be effectively excluded from the distribution in a method which is commonly referred to a trimmed mean (Halli and Rao, 1992: 69-70; Nachmias and Nachmias, 1992: 430-434). This is applicable as income distributions in advanced capitalist societies are not normally distributed. In fact, any sample of income distributions conducted will not approximate normality because the population mean and variances are positively skewed (Nachmias and Nachmias, 1992: 360-364).

Since the variables of household income and personal income were measured as categorical variables within the original Winnipeg Area Study survey data, a relatively accurate representation of each valid response group can be converted into an interval level value within the concatenated final sample. The conversion was accomplished by calculating the mid-point of each income response group and multiplying that mid-point value by the number of cases within that group as demonstrated within Equation IV (Kirk, 1990: 49-50). For example, a respondent who indicated that their personal income was within the '\$40,000-44,999' category would have a value of \$42500 assigned to their re-coded response. The following calculation was applied to achieve the first stage in re-coding the income variables to interval level measures within the concatenated final sample:

EQUATION IV
Determination of Interval Income Values

$$X_i = \frac{(X_{max} - X_{min})}{2} + X_{min}$$

(IV)

Where X_i = Interval income value (personal or household);
 and, X_{max} = Upper limit of category;
 X_{min} = Lower limit of category.

The responses given by the respondent were re-coded as HHINC for the household income and RESINC for personal income. Although the income data can be converted into interval level data, the lack of an original interval level data set to draw from considerably affects the strength of the inferences made from such categorical secondary data. In effect, a number of cases at both ends of the distribution have to be excluded from the total data set in order to convert the Winnipeg Area Study income data in the above manner for utilisation within the concatenated final sample.

Once the personal and household income response value for each respondent were converted from the categorical data into interval level data, each variable must have then been weighted by the year of the Winnipeg Area Study survey to account for inflationary trends. Each personal and household income response was again recalculated for every respondent household by utilising the appropriate base values found in Table XIII. The calculations made to both the response values of the variables personal and household income were based on

TABLE XIII
 Canadian Consumer Price Index, 1981-1991:
 Base 1986 Constant

Year	Canada	Manitoba	Winnipeg
1981	75.5	76.4	76.4
1983	88.5	88.6	88.7
1984	92.4	91.9	91.9
1986	100.0	100.0	100.0
1987	104.4	104.2	104.2
1988	108.6	108.6	108.5
1989	114.0	113.7	113.7
1990	119.5	118.9	118.9
1991	126.2	125.0	125.0

The above index is derived from Statistics Canada (1992a) and missing values were supplemented by the helpful staff and officials at Statistics Canada in Winnipeg.

the measures of the Consumer Price Index for the urban area of Winnipeg.

The Consumer Price Index is a weighted value of the percentage dollar cost required for purchasing a constant set of goods and services for any given year. The set of goods and services is referred to as a 'basket' and is determined to be a static and equivalent defined quantity and quality of these goods and services (Statistics Canada, 1992a: 109). Each item or service has a continually measurable market value which was specified according to purchases made by the target population within the given reference period (Statistics

Canada, 1989a: 9). As a result, these index values represent expenditures of all private households within census urban areas through the pricing of approximately 300 items within a basket (Statistics Canada, 1992a: 109). Finally, each index value refers to the relative value of the basket from the particular year and is derived as a simple additive arithmetic means of the twelve monthly indexes for the given geographical area of measurement (Statistics Canada, 1989a: 16). Within the current study, the constant value of the Consumer Price Index has been established with the base year measured from 1986 dollar values.

Each respondent in the concatenated final sample had their respective household income (re-coded as HHINIDX) and personal income (re-coded as RESINIDX) response values multiplied by one hundred and then divided by the appropriate value determined by the Winnipeg Area Study survey year accordingly from Table XIII. As a result, Equation V demonstrates the final calculation used for the calculation of valid responses for the variables household income and personal income. The final calculation can be accomplished with the application of the following:

EQUATION V
Final Determination of Income Values

$$X_i = \left(\frac{X_{max} - X_{min}}{2} + X_{min} \right) \left(\frac{100}{X_y} \right)$$

(V)

Where X_i = Constant interval income value (personal or household);
 and, X_{max} = Upper limit of category;
 X_{min} = Lower limit of category;
 X_y = Consumer Price Index value for given year of survey.

As a result of this recalculation, a temporally constant weighted and scaled measurement of both the household and personal income response values can be said to have been operationally defined.

The re-coded indexed household income resulted in three thousand four hundred and ninety-one (n=3491) valid cases within the concatenated final sample. Whereas the re-coded personal income had two thousand six hundred and forty-four (n=2644) valid cases. Household and personal income both ranged from a low of fifty-six hundred dollars (min=5600.00) to a high of eighty-four thousand three hundred and thirty dollars (max=84330.79). The household income in constant 1986 dollars had a trimmed mean value (\bar{x} =31076.04) slightly higher than the median value (median=28184.89) with a considerable standard deviation (s^2 =16733.368). For the concatenated final sample, the personal income mean value (\bar{x} =22372.81) was found to be slightly lower than the household income as was the

derived median value (median=20000) and the standard deviation ($s^2=12845.810$). Obviously, the derived differences between household income and personal income are due to the number of income earners within the family.

The household income for the Winnipeg Area Study lone parent families ($n=386$) were found to have a mean value ($\bar{x}=25539.46$), median value (median=22850.93), and standard deviation ($s^2=15035.127$) which were comparatively smaller than that of the household income within the total concatenated final sample. The smallest recorded household income for a lone parent family was just under six thousand dollars (min=5887.30) whereas the maximum value was as high as eighty-four thousand dollars (max=84330.79). As a result of a few cases where a child earned measurable income, the values obtained for the personal income of the lone parent family were found to be nearly equivalent to that of the lone parent family household income. Although the weighted and scaled values still indicate a skewed distribution, the magnitude of each outlier has been reduced considerably from that evident within the original data set measurements. As a result, the household income of the lone parent family will be utilised for further analysis and the above operational definition shall be employed within the analyses found below within chapter four.

In order to complete the delineation of the variables associated with the socioeconomic status of the lone parent

family, occupation must be next examined and delineated within the operational definition of housing affordability as indicated above. The Winnipeg Area Study measured the occupation of the respondent in each of the survey years. The research assistant was directed to query of the respondent the following question:

"What kind of work do/did you normally do? That is, what is/was your job title?"

This question was designed to elicit a single categorical response which would indicate the specific occupation of the respondent.

To ensure that the recorded occupation reflected the true occupation of the respondent, the respondent was asked a second question immediately following the first. The second question involved detailed specification of the first response and entailed the research assistant inquiring:

"What does/did that job involve?"

The respondent was openly invited by the research assistant to describe in detail the type of work that they were employed within. The open-ended constitution of this question was composed to provide sufficient detail from which the

occupation could be accurately recorded within the final Winnipeg Area Study concatenated final sample.

Finally, a third question was included as a cross-reference to ensure that the appropriate standard occupational classification was recorded for the respondent. The research assistant invoked the third question immediately succeeding the preceding question which petitioned the following from the respondent:

"What kind of place do/did you work for?"

Again, the sequence of the three questions were designed by methodological intention to elicit enough information to accurately record the standard occupational classification of the respondent.

After the survey was completed, the three responses to the questions pertaining to occupation would then be re-coded by the individual responsible for data entry. The responses were re-coded into the standard occupational classification as the numerical classification corresponding to the Standard Occupational Classification produced by Statistics Canada for occupational and labour demographic research (Statistics Canada, 1990a). The valid categories for the recorded responses ranged from 1111 to 9991. As a result of this method for coding occupation, each standard occupational classification was recorded within the Winnipeg Area Study and

re-coded for the respondent as RESSOC in the concatenated final sample.

The Winnipeg Area Study had designed SPSS® code to convert the standard occupational classification automatically to the ordinal socioeconomic classification designations initially proposed by Pineo, Porter, and McRoberts (1977). There were two readily apparent problems which resulted from usage of the Winnipeg Area Study data file computer codes. First, the result of the Winnipeg Area Study utilising the 1977 categorical definitions to convert the standard occupational classification into manageable socioeconomic categories failed to account for each of the occupations now listed and recorded by Statistics Canada (Pineo, 1984). The result was a considerable number of cases which were not re-coded within the original Winnipeg Area Study data sets and subsequently these cases were defined as simply missing values in the concatenated final sample. Second, the 1991 Winnipeg Area Study Codebook indicated that the updated Pineo, Porter, and McRoberts (Pineo, 1984) version of socioeconomic classifications had been utilised and provided for within the Codebook. Yet, on closer inspection, the Winnipeg Area Study failed on both accounts: the standard occupational classifications were not re-coded into the 1984 version of the Pineo, Porter, and McRoberts socioeconomic categories and the SPSS® coding scheme was not included in any readily available Winnipeg Area Study documents or data files. As a result, a

new SPSS® code was required to be written to include the categorisation of all possible standard occupational classification measures utilised by Statistics Canada according to the Pineo, Porter, and McRoberts socioeconomic category designations (Pineo, Porter, and McRoberts, 1977; Pineo, 1984).

Once the standard occupational classification measures were determined for each respondent, every response value had to then be re-coded into a manageable system of socioeconomic categories for analysis of the concatenated final sample. With the usage of the socioeconomic categories initially provided by Pineo, Porter, and McRoberts in 1977, and updated in 1984 by Pineo, the standard occupational classifications have been re-coded into the following socioeconomic categories for analysis:

Self-Employed Professionals	01
Employed Professionals	02
High-Level Management	03
Semi-Professionals	04
Technicians	05
Middle Management	06
Supervisors	07
Foremen and Women	08
Skilled Clerical Sales and Service	09
Skilled Crafts and Trades	10
Farmers	11
Semi-Skilled Clerical Sales and Service	12
Semi-Skilled Manual	13
Unskilled Clerical Sales and Service	14
Unskilled Manual	15
Farm Labourers	16

From the total concatenated final sample, it can be discerned that there were two thousand eight hundred and ninety-three

(n=2893) valid responses for occupation in the concatenated final sample. The modal occupational category for the respondent was found to consist of the semi-skilled clerical, sales, and service group (n=497). The distribution of responses for the complete concatenated final sample is reproduced within Appendix II.

Although the socioeconomic categorisation of occupations is useful for explanatory purposes, the sixteen categories become somewhat onerous with respect to analytical application of the lone parent family. If the categories are presented in tabular form for the lone parent family, the cases within each cell begin to become quite small (see Appendix II). Considering that a fairly substantial number of lone parent families within the concatenated final sample have not indicated an occupational classification (n=152), the number becomes even smaller. As a result, the number of lone parents with a recorded standard occupational classification is fairly small (n=234). Furthermore, if the lone parent families were controlled for by the gender of the parent, the frequencies become small enough that there are a number of empty cells (see Appendix III, Selected Variable Tabulations: Concatenated Winnipeg Area Study, 1981-1991).

As a result of the low frequencies which result from the usage of the sixteen socioeconomic occupational categories, the occupational classification must be further categorised for the current study. Essentially, four new categories can

be developed from the sixteen Pineo, Porter, and McRoberts groupings according to the educational training required for the particular occupation. As Wright (1979) has poignantly asserted, the above socioeconomic occupational classifications do not encompass the relationship one has to the means of production. In particular, the educational requirements of the occupations are a necessary component in the creation of a categorisation of occupation groupings (Wright and Perrone, 1977: 43-44). However, the categories suggested by Wright are not completely amenable to the current study nor should the work of Pineo, Porter, and McRoberts be dismissed piecemeal. As a result, four categories of socioeconomic occupation classes can be discerned through the level of education required for entry into that particular occupation. Each of the sixteen categories will be collapsed into one of four designated categories and re-coded as ROCCUP within the Winnipeg Area Study concatenated final sample.

First, the new category of 'professional occupations' can be designated within the concatenated final sample. This category will include those occupations which require substantial post-secondary education, usually indicative of second degrees granted by universities such as a doctorate, masters, legal, or medical degree. As a result, the Pineo, Porter, and McRoberts categories of 'self-employed professional' (01), 'employed professional' (02), 'high level

management' (03), and 'semi-professional' (04) will be collapsed into the first category.

Second, the category of 'specialised occupations' can be specified from the socioeconomic occupational classifications. This category would be comprised of occupations which normally require moderate post-secondary training prior to employment. For example, chemical technicians and retail management are two occupations individuals may receive training for from a community college or university. Accordingly, occupations for which individuals who have received lower level university and technical college training would constitute the majority of the second category. Therefore, the Pineo, Porter, and McRoberts categories of 'technician' (05), 'middle management' (06), 'supervisors' (07), and 'foremen/women' (08) will be combined into the second category.

The third category of occupations can also be related to education through the training required of the individual for that group of occupations. The third category can be denoted as 'trained occupations' and will encompass those occupations which require some specific training for employment. In most cases, these occupations can be trained for while 'on the job' or through some form of apprenticeship. For example, a metal machinist would require a number of years training while on the job to be categorised as a skilled tradesman (category 9 above). Moreover, similar 'on the job' educational training is required of those occupations in the service or crafts

professions. As a result, the Pineo, Porter, and McRoberts classifications of 'skilled clerical-sales-service' (09), 'skilled crafts and trades' (10), 'semi-skilled clerical-sales-service' (12), and 'semi-skilled crafts and trades' (13) will each be combined into the third reconstituted occupational classification.

Finally, the occupations which require little or no formal educational training can be classified into the fourth category. This category will be termed 'manual occupations' due to the requirements of physical ability rather than specific occupational training. For example, occupations which undertake such employment as road repair, retail cashier clerks, or direct agriculture would be within this designation. The category will be comprised of the Pineo, Porter, and McRoberts categories of 'unskilled clerical-sales-service' (14), 'unskilled manual labour' (15), 'farmers' (11), and 'farm labourers' (16).⁴

The results of the collapsed occupational categories are presented within Table XIV. As evident from the constructed tabulation, the respondent within all family types was most likely to be employed within the trained occupations (n=1365).

⁴It must be noted that inclusion of the 'farmer' occupation within the latter category would be contentious at the very least due to the formal university and technical training many farmers do indeed receive. Yet, the required formal educational level for that occupation is very low. Nonetheless, the debate would require more attention than can be devoted within the current study--particularly since there are no (n=0) farmers among the lone parent families within the Winnipeg Area Study concatenated final sample.

TABLE XIV
Winnipeg Area Study:
Occupational Category of Respondent by Family Type, 1981-1991
(Percentages)

Occupational Category	Lone Parent Families: Women	Lone Parent Families: Men	Total Family Types
Professional Occupations	40 (22.60)	10 (17.54)	702 (24.27)
Specialised Occupations	27 (15.25)	4 (7.02)	433 (14.97)
Trained Occupations	90 (50.85)	30 (52.63)	1365 (47.18)
Manual Occupations	20 (11.30)	13 (22.81)	393 (13.58)
n =	177	57	2893

Similarly, lone parent families headed by both women (n=90) and men (n=30) were also most likely to have employment within the trained occupations. Of those lone parent respondents employed, women were proportionally more likely to be employed in the professional (women=22.6%, men=17.5%) and specialised occupations (women=15.3%, men=7.0%) than men. Conversely, men lone parents were more likely to be employed in the trained occupations (women=50.8%, men=52.6%) and manual occupations (women=11.3%, men=22.8%) than women. The chi-square test of hypothesis can be implemented to determine if there are statistically significant differences between the observed relationships and the observations which would be expected. A null hypothesis of no difference between the occupations of men and women lone parents can be tested. The findings

demonstrate a chi-square value ($\chi^2=6.7989$), with three degrees of freedom ($df=3$), which indicate that the null hypothesis can be cautiously rejected with a probability within the region for rejection ($p=0.07859$).

As can be discerned from the distribution of socioeconomic occupation categories found within Appendix II, there were seventeen hundred and fifty-seven ($n=1757$) cases within the concatenated final sample where no occupation was recorded for the respondent. The category of not applicable can be explained as the result of those individuals whom were identified as not within the labour force due to a number of personal circumstances. Within the concatenated final sample, each respondent had their primary activity identified by the response to the following question:

"What is your current employment or work situation?
For each of the following, please tell me if it
applies to you."

The research assistant was directed to ascertain responses to each of the categories 'employed full-time,' 'employed part-time,' and 'retired' prior to requesting further information from the respondent.

If the respondent had answered in the negative to all three of the employment categories, the research assistant was directed to proceed with establishing which other primary

activities the respondent was responsible for. Thus, responses to the following question were surveyed from the respondent:

"People also do a variety of other types of work, even though it may not involve a paid job. For each of the following, please tell me if it applies to you."

The possible responses given to the respondent were 'mainly responsible for housework,' 'mainly responsible for raising a child or children,' 'taking care of some other dependent person,' 'currently going to school or studying in some program,' and 'doing some volunteer work.' The frequency distribution of responses to each of the above questions is reproduced within Table XV for all the individuals within the concatenated final sample.

Evident from Table XV, each respondent was able to identify more than one primary activity they were responsible for. Of the total number of lone parent families (n=386), there were two hundred and forty-one respondents identified as employed (n=241). From the responses given by those respondents heading lone parent families, there were forty-three (n=43) indicated as unemployed; six (n=6) responded that they were retired; sixty-seven (n=67) answered that they were in school; one hundred and sixty-two (n=162) indicated that

TABLE XV
 Winnipeg Area Study:
 Respondent Primary Activity by Family Type, 1981-1991

Primary Activity	Lone Parent Families: Women	Lone Parent Families: Men	Total Family Types
Employed	185	56	2715
Unemployed	34	9	383
Retired	5	1	663
In School	43	24	427
Keep House	141	21	1767
Raise Child	52	7	282
Other	46	6	179
n =	300	86	4650

they kept house; fifty-nine (n=59) indicated that they raised their child (children), and; fifty-two (n=52) indicated that they had other responsibilities such as taking care of an elderly individual (n=14) or volunteer work (n=38). Although the response categories within Table XV are not mutually exclusive, the data derived from these questions assist somewhat in delineating the qualitative aspects of activities partaken by those individuals not in the formal labour force. In particular, the data from Table XV can serve a comparative purpose when investigating differences between men and women lone parents. Finally, each of the categorised occupational codes from Table XIV and non-occupational activities from Table XV can be combined into a single categorised measure for the analysis found in chapter four.

In order to create a meaningful ranked scale of occupational measures for the respondent which includes non-occupational primary activities, both measures required consolidation into a single measure. A measure for those individuals not employed needed to be included for a more representative measurement of the housing affordability construct. Thus, the categories from Table XIV were reversed in order with the non-occupational category ranking the lowest on the scale to provide a measure of occupation. The scale was accordingly developed as the following:

Not Employed	01
Manual Occupations	02
Trained Occupations	03
Specialised Occupations	04
Professional Occupations	05

These categories will provide a means by which all occupational statuses can be measured in the analysis of housing need for the lone parent family.

With the identification of the household members and entire family composition considered above, the gender of the respondent was also recorded. In each of the Winnipeg Area Study survey years, the research assistant was required to record the gender of the respondent immediately after a successful contact had been established. The gender of the respondent was re-coded within the concatenated final sample as RESGEND. Evident from the above discussion, the variable of gender is a significant predictor of differences between men and women lone parent families measured through different

TABLE XVI
 Winnipeg Area Study:
 Respondent Gender by Family Type, 1981-1991
 (Percentages)

Family Type	Respondent Gender: Men	Respondent Gender: Women	Total
Lone Parent w/children	86 (1.86)	300 (6.49)	386
Two Parent w/children	629 (13.61)	754 (16.31)	1383
One Adult w/o children	675 (14.60)	850 (18.39)	1525
Other Families w/o children	651 (14.08)	678 (14.67)	1329
n =	2041	2582	4623

Missing cases = 27.

socioeconomic variables. As a result, the measurement of gender will simply encompass the binomial response values of men and women.

Although the frequency distributions of gender for the lone parent family have been presented above, the gender of the respondent for each of the family types is presented within Table XVI. There were four thousand and twenty-three (n=4623) valid cases recorded for the variable of gender within the Winnipeg Area Study concatenated final sample. Of the respondents identified as lone parent families, eighty six (n=86) were headed by men whereas three hundred (n=300) were headed by women. Lone parent families headed by women constituted slightly over six percent (6.49%) of all respondents and seventy-eight percent (77.72%) of lone parent

families within the total concatenated final sample. Lone parent families headed by men represented two percent (1.86%) of the total concatenated final sample and twenty-two percent (22.28%) of lone parent families.

From the heuristic model found within Figure V, the variable of age can be observed as the last explanatory variable proposed for the construct of housing affordability within the analysis and measurement of housing needs for the lone parent family. As noted above, the research assistant was directed to ascertain the age of each household member commencing with the respondent and then accordingly record the response given in number of years. Although each of the surveys recorded the age of the respondent, the 1983 Winnipeg Area Study recorded age in terms of the number of months. As a result, each response was divided by twelve (12) to calculate the equivalent number of years. The responses from all of the Winnipeg Area Study survey years have been re-coded as RESAGE within the concatenated final sample.

The age of the respondent was recorded in four thousand five hundred and seventy-one ($n=4571$) cases. As each respondent had to meet the minimum age criteria listed above, the minimum age of all respondents was eighteen ($\text{min}=18$) years of age whereas the maximum age was ninety-eight ($\text{max}=98$). The mean age of all the respondents was found to be forty-two and one-half ($\bar{x}=42.502$) years and the standard deviation was calculated to have been seventeen ($s^2=16.954$) years.

With respect to the lone parent families surveyed, the mean age was determined to be thirty-three ($\bar{x}=33.283$) years of age and the standard deviation was computed to be eleven ($s^2=11.159$) years. There were four ($n=4$) missing lone parent age response values within the concatenated final sample resulting in a total of three hundred and eighty-two ($n=382$) valid cases. Lone parent families headed by women ($n=296$) had a mean age of thirty-four ($\bar{x}=34.25$) years with a standard deviation of ten and one-half ($s^2=10.54$) years. Surprisingly, lone parent families headed by men ($n=86$) had an average age of thirty ($\bar{x}=29.95$) years with a standard deviation of twelve and one-half ($s^2=12.56$) years.

As the mean age of lone parent families would appear to differ by gender, a test of hypothesis can be conducted to determine if this is statistically authentic. The t -test can be appropriately applied to determine if the null hypothesis should be rejected as each of the variables are random and independent and both have samples greater than thirty ($n_i \geq 30$) cases (Norušis, 1991: 227-239). The null hypothesis of no difference between the means results in a t -value ($t=-3.18$) with three hundred and eighty degrees of freedom ($df=380$). This calculation, based on a two-tailed probability and ninety-five percent confidence interval ($\alpha=0.05$, $CI=\pm z_{\alpha/2}$), results in a significant probability ($p=0.002$) for rejection of the null hypothesis of no difference between the means. That is, there is no substantial evidence that the average age

of the men and women whom head lone parent families is equivalent. Moreover, the women who head lone parent families are likely to be older than lone parent families headed by men.

In order to facilitate the testing of the hypotheses from chapter two, the age of the respondent required categorical transformation. As well, ranked age categories would enable comparison with the Statistics Canada data presented within chapter two. Therefore, the age of the respondent was transformed into seven categories through the following scale of measurement:

≤24	. . . . .	01
25-29	. . . . .	02
30-34	. . . . .	03
35-39	. . . . .	04
40-44	. . . . .	05
45-49	. . . . .	06
≥50	. . . . .	07

As a result of the categorical manipulation of the Winnipeg Area Study data, each of the independent variables within the dimension of housing affordability can be said to have been sufficiently defined for operational measurement and analyses. Thus, the method of data analyses must now be addressed and delineated.

3.5 METHOD OF DATA ANALYSES

This section will attempt to organise and present the methods for data analyses which will facilitate the testing of the hypotheses found in chapter two. Evident from the preceding discussion, the relationships between variables which directly or indirectly influence lone parent family housing needs can be empirically investigated through a number of different statistical procedures. In particular, measures of differences between variables were conducted through application of the chi-square, eta-square, and t-test where deemed appropriate. As well, measures of correlation were introduced to determine the degree of association between key socioeconomic variables. Furthermore, an analysis of variance was performed to determine differences between multiple group means. Although a number of statistically significant bivariate relationships were studied and demonstrated in the previous section, a more comprehensive analysis can be executed. Therefore, a method of analysis is required which effectively combines the statistical measures utilised above to evaluate the independent and dependent variables simultaneously.

The differing degrees of relationship between the socioeconomic variables discussed above were important to identify and measure. Yet, this level of bivariate analysis is somewhat representative of analyses conducted within much of the previous research on lone parent family housing needs

within Canada. As a result of this evaluative deficiency, this section shall organise a more appropriate methodological framework to analyse lone parent family housing needs. Moreover, each of the socioeconomic variables encompassed within the dimensions of housing suitability and housing affordability can be concurrently assessed for the combined predictive ability of each in estimating the degree to which a lone parent family will have housing need. In effect, conclusions pertaining to the relationships between socioeconomic variables can be developed in a manner which effectively measures and predicts differences while allowing control of the key independent variables. Therefore, the following will address the specific testing of each hypothesis as postulated and articulated within chapter two.

In order to draw relevant conclusions from the questions used in each of the Winnipeg Area Study survey years within the concatenated final sample, this section will delineate a specific method for the final analysis. As each of the independent and dependent variables have been validated through the operational methodology employed within the previous section, the hypothesis testing will be implemented by a two stage method. First, a test of the hypothesised relationships postulated above will be introduced to ascertain if the socioeconomic variables are significantly related to one another. This will be accomplished through two distinct statistical techniques for analysis. For the first analysis,

the *t*-test will be employed to test hypothesis c) from chapter two. Then, the utilisation of the analysis of covariance procedure, which simultaneously tests if each of the possible relationships and interactions between each variable are indeed different, will determine the level of interaction among the relationships hypothesized within hypotheses d) through f) from chapter two.

The analysis of covariance method will set the framework for the linear test of the hypotheses which utilises both qualitative and quantitative independent variables (Fox, 1984: 135). More specifically, the analysis of covariance method tolerates a linear test of the hypothesis with nominal, ordinal, and interval level independent variables. In essence, the analysis of covariance combines the techniques found within the analysis of variance and correlation (dummy-variable regression) analysis to investigate heuristic models such as that found within Figure V (Blalock, 1972: 474; Fox, 1984: 135-136). Moreover, the reliability and predictability of the theoretical relationships postulated within chapter two can be directly assessed.

Although a chi-square test could be used to test each possible contingency table, the resulting saturated model would be unmanageable. As Blalock (1972) succinctly noted, the analysis of covariance is normally limited to the analysis of a small number of independent variables because the number of computations required to determine higher order

interactions would be beyond normal computational means. In fact, the final number of contingency tables would result in four thousand six hundred and twenty ($n=4620$) possible cross-classified tables measuring income by housing suitability for the lone parent family.

Although the level of analysis required for the analysis of covariance technique would appear to be unimaginable, the computational resources for this level of analysis are readily available today. Moreover, the application of the analysis of covariance will help somewhat in reducing the number of higher order interactions to a more manageable level. In effect, reducing the number of possible effects can be accomplished to produce a more parsimonious evaluation of the empirical relationships between socioeconomic variables. Finally, the analysis of covariance procedure will allow the different variables to be simultaneously analysed while accounting for the incremental explanatory nature of each variable and for the interaction between combinations of variables. Ultimately, this will help to further explain the underlying variables determining housing conditions for the lone parent family.

As the null hypotheses for hypothesis a) and hypothesis b) have already been tested, the remaining hypotheses will be addressed within chapter four. First, hypothesis a) stated that the housing needs of the lone parent family were related to the housing suitability of that household. Second,

hypothesis b) postulated that the possibility of housing needs varies inversely to and significantly by the number of adults in the family. Assuming that the above definition of housing suitability has theoretical validity, the test of hypothesis can said to be accomplished by the measures undertaken above. In effect, each of the two hypotheses have already been tested and it has been demonstrated that there exist differences between family types.

Third, hypothesis c) can be empirically evaluated through the different mean values for men and women lone parent families on the dependent variable of housing suitability. As the gender of the lone parent has been demonstrated as either constituting a woman or a man, the two point dichotomy can be tested adequately with the comparison of the derived mean measure of housing suitability. In other words, the ability to achieve a measure of housing suitability depends upon the gender of the lone parent. This can be evaluated through a paired *t*-test of housing suitability conditional upon the gender of the respondent.

Finally, hypothesis d) proposed that the potential for housing need increases with a decrease in the measure of housing affordability for the lone parent family. In other words, there is an inverse relationship between the independent variables within the factor of housing affordability and the factor representing housing suitability. This hypothesis can be directly tested with the analysis of

covariance technique. Moreover, the extent of the relationship between housing affordability and housing needs, as measured by housing suitability, can be determined and assessed through the comparison of the variance derived from the analysis of covariance.

With the analysis of covariance method, hypothesis e) and hypothesis f) can also be tested within a single procedure. Hypothesis e) argued that the socioeconomic status of the lone parent adult is negatively related to the magnitude of housing needs. The measurement of socioeconomic status can be undertaken in conjunction with hypothesis f) to examine the interaction between the variables constituting the remainder of the dimension representing housing affordability for the lone parent family. This will simplify the validity assessment of the heuristic model and the analysis of hypothesis d) through a theoretically driven analysis. Finally, this segment of the analysis will contribute to further understanding of adequate housing suitability for the lone parent family.

Each of the above tests reflect the hypotheses as stated and ordered in terms of importance within chapter two. It is important to follow the hypotheses as stated within chapter two to demonstrate the deductive logic which has resulted from the literature review. As a result, chapter four will endeavour to test each hypothesis in the order that presented within chapter two.

CHAPTER FOUR:
EMPIRICAL ANALYSES

4.1 INTRODUCTION

The purpose of this chapter is to evaluate the relationships proposed above in order to further pedagogic understanding of lone parent family housing needs. To achieve this end, the hypotheses stated within chapter two will be empirically tested from the Winnipeg Area Study concatenated final sample. The chapter will proceed with an investigation of each of the hypotheses in turn as presented above. This will include a delineation of the measures of association and related statistics for each of the given hypotheses. Furthermore, each section will include tabular presentations of the respective analysis to ensure the possibility for future replication and confirmation (or refutation) of the findings. Finally, a presentation of other significant relational findings between variables which became apparent will be identified for the current study.

In the first section, the possibility of different housing need levels between lone parent families headed by men and women will be evaluated. In essence, the first section will theoretically ensure that the analysis of the current study has a measure of face validity. Following this, the second section will examine the degree to which housing needs

for the lone parent family can be determined through inspection of each independent variable. This will include an assessment of the total heuristic model from Figure V and the constituent factors therein. The discussion of the findings from each of the analyses will be presented in the final chapter.

4.2 LONE PARENT HOUSING NEEDS FOR MEN AND WOMEN

As hypothesized within chapter two, the housing needs of lone parent families were postulated to differ significantly by the gender of the respective lone parent. In order to test the hypothesis c), the null hypothesis that there is no statistically significant difference between men and women lone parent families must be established. Kirk (1990: 378-381) has suggested that a five stage method be followed to determine if there are no differences between the means of two independent sample populations.

First, the hypothesis and null hypothesis must be presented through the use of the following propositional equation:

EQUATION VI

Hypothesis of Different Means: Men and Women Lone Parents

$$H_0: \mu_w - \mu_m = \delta_0 \qquad H_1: \mu_w - \mu_m \neq \delta_0$$

(VI)

Where μ_w = Mean housing suitability for women;
 and, μ_m = Mean housing suitability for men;
 δ_0 = Predicted difference between population means (0).

Explicitly stated, the null hypothesis (H_0) within Equation VI postulates that there is no difference between the mean measure of housing suitability of men and women lone parent families. For women lone parents, the mean housing suitability index measure was one and one-half ($\bar{x}=1.5273$,

$s^2=0.820$). For lone parent families headed by men, the mean index value was over two ($\bar{x}=2.1127$, $s^2=1.098$). After the hypothesis and null hypothesis have been explicitly stated, the second and third stage of the hypothesis test must each be specified (Kirk, 1990: 381).

The designation of the test statistic to be employed for testing the null hypothesis constitutes the second stage. As the measures utilise the interval level measure of the housing suitability index and the nominally measured independent but dichotomous variable of gender, the appropriate test of hypothesis can be undertaken through usage of the two sample t-test (Mendenhall, 1983: 306-307). Thus, the two sample t-test statistic for the null hypothesis, with the inclusion of the pooled variance estimation technique, can be presented in Equation VII as follows:

EQUATION VII
Hypothesis Test Statistic: Two Sample t-test

$$t = \frac{\bar{X}_w - \bar{X}_m - \delta_0}{\sqrt{\frac{(n_w-1)s_w^2 + (n_m-1)s_m^2}{(n_w-1) + (n_m-1)}}$$

(VII)

Where \bar{x}_w = Sample mean housing suitability for women;
and, \bar{x}_m = Sample mean housing suitability for men;
 n_w = Sample size of women lone parents;
 n_m = Sample size of men lone parents;
 s_w = Sample variance of housing suitability for women;
 s_m = Sample variance of housing suitability for men;
 δ_0 = Predicted difference between population means (0).

To facilitate the delineation of the component elements of the test of hypothesis found within Equation VII, the sample sizes and sample variances must be specified and the respective importance of each must be discussed to fulfil the third stage.

The specification of the sample size is particularly important as the number of cases sampled serves in part to determine parameters for the confidence and power of the hypothesis test (Kirk 1990, 329-336; Nachmias and Nachmias, 1992: 455-456). As well, the variances of the samples are pivotal for the determination of the probability in which a hypothesis decision error may occur. In effect, the determination of the alpha coefficient (confidence) and the beta coefficient (power) directly determine the probability of making errors in deciding to accept or reject a null hypothesis.

According to stage three of the hypothesis test, the sample sizes and sampling distribution must be specified prior to applying the test (Kirk, 1990: 381). The number of lone parent families headed by women within the concatenated final sample equal two hundred and sixty-one ($n_w=261$) and the lone parent families headed by men equal sixty-eight ($n_m=68$).⁵ As evident from Equation VII, the calculation of the pooled variances accounts for the different sample sizes. Although

⁵The final sample size is based on missing values for the indexed housing suitability measure (HHSUIT) as discussed within chapter three.

it is possible to test if the variance of each sample is significantly different through a F statistic, the variances will be assumed to be equivalent for the current test of hypothesis.

Kirk (1990: 410) has noted, contrary to the recommendations found within some statistics texts, that there are difficulties with testing the assumption of equality of variances prior to implementing a *t*-test to determine if significant difference between two independent samples exists ($\mu_1 - \mu_2 = \delta_0$). In fact, Kirk (1990: 410) has cautioned against using the F statistic to test the assumption of equal variances ($\sigma^2_1 = \sigma^2_2$) for the *t*-test as the F statistic is both as sensitive to non-normal distributions as it is to unequal variances and, as a result, "an experimenter may be dissuaded from using a *t*-test when it is actually appropriate." Nevertheless, the SPSS® software accommodates this dilemma by computing the *t*-test under both possibilities: one calculation is derived under the assumption of equal variances and one for unequal variances (Norusis, 1990b: 161-166).

In order to demonstrate adequately the fourth stage for the hypothesis test, the parameter designating the level of significance must be established to avoid making a Type I error (Kirk, 1990: 329-330). As the arbitrarily selected but established sociological practice dictates, the confidence level has been set at five percent ($\alpha=0.05$) for the test of hypothesis. That is, there is a five percent chance of

falsely rejecting the true null hypothesis (Type I error) that there is no significant difference between the housing suitability for men and women lone parents. Conversely, selecting this alpha coefficient specifies that the probability of failing to reject the null hypothesis when the null hypothesis should be accepted will be set to a ninety-five percent ($1-\alpha=0.95$) level of confidence.

Once the above four stages have been delineated, the determination of the power of the statistical test (beta coefficient) can be calculated. The power of the statistical test ($1-\beta$) is directly related to the independent sample sizes for men and women lone parent families; the population variances; the level of difference between sample means of men and women lone parent families; the confidence interval outlined for the null hypothesis (h_0); and, the level of confidence ($1-\alpha$) as discussed above (Kirk, 1990: 330-331). In particular, the probability of failing to reject the false null hypothesis (h_0) of no statistically significant housing suitability differences between men and women lone parents is denoted by β and can be classified accordingly as a Type II error. Conversely, the establishment of the power ($1-\beta$) of the statistical test determines the probability of correctly rejecting a false null hypothesis (Nachmias and Nachmias, 1992: 455-456).

As the population means are not known for either men or women, the calculation of the β can utilise Cohen's small

effect size as a significant measure of the difference between the sample means. Cohen's small effect size is calculated by taking the pooled variance and multiplying the result with a magnitude of relative difference based upon standardised score theoretical assumptions. Cohen designated 0.2 to test small differences between means, 0.5 for medium differences, and 0.8 for large differences (cited in Kirk, 1990: 334). The 0.2 level will be utilised so that the most stringent measure in determining possible differences between the mean indexed housing suitability measures for men and women lone parent families will be measured. As a result, the population means can be estimated for the determination of the standardised β and power $(1-\beta)$ of the hypothesis test.

To conclude the final stage prior to testing the hypothesis, the β and power $(1-\beta)$ of the statistical test can be calculated from the following equation:

EQUATION VIII
Probability of Correctly Rejecting a Hypothesis

$$z_{\beta} = \left(\frac{z_{(\alpha/2)} \sigma_p / \sqrt{n_w + n_m} - d_{(.2\sqrt{\sigma_p})}}{\sigma_p / \sqrt{n_w + n_m}} \right) / 2$$

(VIII)

Where z_{β} = Standardised score for β ;
 and, $z_{(\alpha/2)}$ = Confidence interval for two tailed test;
 σ_p = Pooled variances of housing suitability.
 n_w = Sample size of women lone parents;
 n_m = Sample size of men lone parents;
 $d_{(.2\sqrt{\sigma_p})}$ = Cohen's small effect size.

From Equation VIII, the power of the hypothesis test can be calculated to be at a fairly reliable level ($\beta=0.2022$) and indicative of an acceptably low level of the probability for a Type II error (Kirk, 1990: 332). This measure indicates that the probability of failing to reject the false hypothesis is slightly over twenty percent. As a result, there is almost an eighty percent likelihood ($1-\beta=0.7978$) that a correct rejection of a false hypothesis will occur. Considering that Cohen's small scale effect has been distinguished for the parameter estimation, the power of the test can be said to meet appropriate standards.

As each of the four stages required prior to executing the *t*-test of hypothesis have been completed, it is now possible to calculate the null hypothesis test statistic with a measure of certainty. The complete results of the *t*-test are presented within Table XVII. To reiterate, the hypothesis test of the null hypothesis (h_0) was to determine if there were no statistically significant differences between the average indexed housing suitability measure for men and women lone parents. As mentioned above, the results have been presented to include *t*-tests using both the assumptions of equal variances and unequal variances. As well, the complete statistics, *t*-values, and degrees of freedom (*df*) have been included to facilitate replication.

Evident from the findings within Table XVII, the null hypothesis of no difference between housing suitability

TABLE XVII
 Winnipeg Area Study:
 Lone Parent Housing Suitability by Gender, 1981-1991
 (Statistics)

t-Test Sample Statistics	Lone Parent Men	Lone Parent Women	Pooled Values
n=	68	261	329
\bar{x} =	2.1127	1.5273	1.6483
s^2 =	1.098	0.820	0.914

(t-test statistics)

Assume Variances	t-value	df	2-Tailed Significance	Confidence Intervals (1- α =0.95)
Equal	4.86	327	$p < 0.000$	(0.349, 0.822)
Unequal	4.11	87.44	$p < 0.000$	(0.302, 0.869)

Missing cases = 57.

measures for men and women lone parents must be rejected. The t-value of almost five ($t=4.86$), with three hundred and twenty-seven degrees of freedom ($df=327$), indicates that the differences between the means would be indicative of the region for rejection. Moreover, the probability that the null hypothesis should not be rejected is very low ($p < 0.000$) due to the relatively large t-value. Therefore, it must be concluded that the t-values derived from the t-test of hypothesis indicates that the Winnipeg Area Study concatenated final sample demonstrates differences between the housing suitability of men and women lone parent families.

Furthermore, as the test of hypothesis was designed to test a non-directional null hypothesis between the means, the more stringent confidence values (α) can be applied to a directional statement of the test results. Therefore, as demonstrated within Table XVII, the mean indexed housing suitability of men headed lone parent families can be said to be significantly higher than that of women headed lone parent families. Thus, the analysis must now consider the postulates of hypotheses d) through f) as discussed above.

4.3 DETERMINATION OF LONE PARENT HOUSING NEEDS

To reiterate the associations between the socioeconomic variables addressed within the above discussion, the theoretical framework and conceptual heuristic model introduced suppositions which necessitate investigation of the connections between the dimensions of housing affordability and housing suitability. As well, it was hypothesized above that the factors within the dimension of housing affordability directly and indirectly affect the housing suitability of the lone parent family. Moreover, it was argued that the dimension of housing affordability can be decomposed into the independent variables of education, income, occupation, gender, and age. Therefore, the purpose of this section is to delineate and appraise the effectiveness of measuring the different relationships between and within the factors of housing affordability as they relate to the housing suitability of the lone parent family. Furthermore, the variance explained by each independent variable can be ascertained in the development of a more comprehensive explanatory approach to understand the housing needs of the lone parent family.

In order to delineate the relationship the independent variables which constitute housing affordability have upon the dependent variable of housing suitability, this section will be divided with the following five distinct objectives. These objectives include meeting the assumptions for an analysis of

variance; implementing an analysis of variance on the ordinal level independent variables; the introduction of the type of household dwelling as an independent variable for improved analysis; the introduction of household income as a covariate within the analysis; and, then the final test of hypothesis undertaken with the use of the analysis of covariance statistical technique.

For the first objective, the assumptions required to utilise the analysis of variance statistical technique will be discussed and appropriate tests of the assumptions will be implemented where required. This will include a discussion of the population distribution from which the sample was drawn. Furthermore, the first objective will provide the basis for evaluation of the heuristic model within the analysis of covariance technique.

Then, the test of the null hypothesis of no difference between the means of each factor will be conducted. The second objective will not include the independent interval level variable of household income as it would be inappropriate to measure this type of independent variable with the analysis of variance technique. Yet, as Berenson, Levine, and Goldstein (1983) have argued, the analysis of variance should be conducted prior to an analysis of covariance to determine how much contribution the latter technique can offer over the former in the explanation of the variance within the total equation.

Once the second objective has been met, a new independent variable will be introduced to help explain the residual variation measured between the factors of housing affordability for lone parent families. The introduction of another independent variable will help to increase the explained measures and theoretically expand the explanation of housing suitability for the lone parent family. As the measurement of the household dwelling type was conducted with the usage of ordinal level indicators within the Winnipeg Area Study concatenated final sample, the analysis of variance will readily accept the introduction of another explanatory independent variable within the equation.

For the fourth objective, the analysis of covariance technique will be introduced to incorporate the concomitant variable of household income. As the indexed household income values are measured at the interval level, the analysis of variance technique does not provide the necessary explanatory measures that such a variable offers. The usage of the covariate household income somewhat resembles the linear regression technique but the total analysis of covariance technique also embodies the theory and concepts of the dummy-variable regression method to analyse each of the factors. As a result, the necessary additional assumptions for the analysis of covariance model will be discussed and presented as they apply to the current analysis.

Following this, the complete relationship between the independent factors of housing affordability will be measured and tested within the theoretical framework postulated above for the null hypothesis of no difference. Ultimately, this will facilitate measures to determine the explanatory strength of each of the independent variables for the housing suitability of the lone parent family. Finally, the analysis of covariance will sustain the determination of the specific relationships within the housing needs of lone parent families from the concatenated final sample according to the heuristic model within Figure V.

The Analysis of Variance: Measurement Assumptions

The most appropriate manner in which to discuss the application of the method to analyse housing needs for the lone parent family is to merely describe the process as it was undertaken. As the analysis of covariance method embodies the techniques of analysis of variance and correlational analysis (dummy-variable regression analysis), each of the respective assumptions for each technique must be addressed accordingly. As a result, a rather straightforward and rigid delineation of the assumptions required to be met for the analysis of variance will be presented according to the advice of Kirk (1990: 471-472).

As with the previous hypothesis test, the analysis of variance first requires specification of the null hypothesis. The omnibus null hypothesis will suffice for the current objective as the specific relationships between variables will be addressed within the analysis of covariance technique. Therefore, the null hypothesis that there is no statistically significant relationship between the different factors of lone parent housing affordability and their respective housing suitability levels will be empirically tested. As Kirk (1990: 450) has demonstrated, the null hypothesis can be established in a similar manner as was in the previous section through the following equation:

EQUATION IX
Hypothesis of Different Factor Means:
Men and Women Lone Parents

$$H_0: \mu_1 = \mu_2 = \mu_3 = \dots, \mu_p \qquad H_1: \mu_j \neq \mu_j$$

(IX)

Where $\mu_1, \mu_2, \mu_3 \dots, \mu_p$ = The means of $p \geq 2$ populations;
 and, μ_j = Any factor mean;
 $\mu_{j,}$ = Any factor mean other than μ_j .

As can be discerned from Equation IX, the null hypothesis merely states that there are no differences between the factors of housing affordability. As a result, the hypothesis on the right offers only the plausibility of some difference between any combination of the factors within housing affordability. Yet, the usefulness of both the null

hypothesis and test hypothesis will become more evident from the following discussion.

Once the null hypothesis has been specified, the assumptions for the analysis of variance can be directly addressed (Kirk, 1990: 465). From the null hypothesis, it can be deduced that the test of hypothesis will utilise a fixed-effects model. That is, all of the treatments are included within the full model ($x_{ij} = \mu + \alpha_j + e_{ij}$) which includes complete measures of the residual effects (Kirk, 1990: 460). The assumption that the analysis of variance will investigate all the treatments must be met to draw meaningful conclusions. In particular, the null hypothesis will address only the p effects represented in the experiment but will calculate all treatment levels of a saturated model. The number of interactions are derived within the F ratio calculated from the following equation:

EQUATION X
Analysis of Variance: F-Statistic

$$F_{(\alpha, v_1, v_2)} = \frac{\sigma_e^2 + n \sum \alpha_j^2 / (p-1)}{\sigma_e^2}$$

(X)

Where F= F-statistic ratio of the between groups mean square divided by the within groups mean square;

and, α_j^2 = Random population treatment effect;

σ_e^2 = Population error variance;

v_1 = Degrees of freedom for numerator;

v_2 = Degrees of freedom for denominator;

p = Number of treatment levels;

α = Probability of Type I error;

n = Sample size of lone parents.

Accordingly, Equation X explicitly requires that assumptions be met with regards to the within groups mean square and the between groups mean square.

In particular, the measures of within groups mean square (denominator in Equation X) and between groups mean square (numerator in Equation X) must be independent while being estimates of the same population variance (Kirk, 1990: 471). With this, it must be assumed that the sample observations have been drawn from a normally distributed population. As with the *t*-test above, this assumption can be presumed to have been met because a comparison of factor variances within the *F* statistic can also be robust with deviations from normal variance distributions (Kirk, 1990: 474). Finally, the sample size must be determined to be appropriate for the given analysis. To this end, the number of cases should equal thirty for each treatment ($np=30$) in the analysis to ensure adequate measures of the variability (Kirk, 1990: 465).

The confidence level must then be selected for the analysis of variance technique. Again, the level of confidence will be chosen by convention and set at ninety-five percent ($\alpha=0.05$) for each of the following analyses. With this, the sample size and sampling distribution must be selected for the analysis. The sampling distribution to be used for the test statistic is the *F* distribution as demonstrated within Equation X. The sample size differs slightly for each of the analyses found below due to missing

values scored on one or another variable in the equation. As well, the power of the statistic is directly related to each of the measures of variance within the given model. Therefore, the sample size and power will be discussed within the appropriate different analysis of variance measures below.

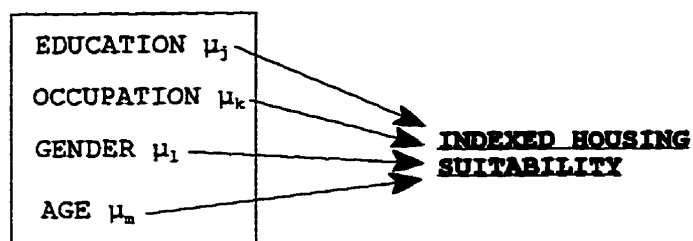
Preliminary Analysis of Variance: Lone Parent Housing Needs

In order to determine the strength of the relationship between the variables presented within the heuristic model from Figure V, a statistical assessment of variables is necessary. This can be accomplished through three succeeding analyses. As can be seen from the following preliminary analysis, the relationship of the independent variables of education, occupation, gender, and age are significant predictors of housing suitability for the lone parent family. From Figure VI, it can be discerned that the relationship is predicated on only four of the five independent variables discussed within the conceptual development above. Due to the fact that each of the independent variables are measured at the ordinal level and housing suitability of the lone parent is measured at the interval level, a supplementary heuristic model demonstrating the preliminary analysis of variance is presented within Figure VI.

The power of the statistical test can be accordingly calculated utilising the principles of Equation VIII. The

FIGURE VI
Preliminary Assessment of Lone Parent Housing Needs

**FACTORS OF HOUSING
AFFORDABILITY**



number of lone parent families include in the preliminary analysis is equal to three hundred and twenty-six ($n=326$) due to missing values. As a result, the probability of a Type II error (β) can be determined to be slightly under twenty-six percent ($z_g=-0.6498$, $\beta=0.2579$). Therefore, the power of the statistical test can be deduced to be approximately seventy-four percent ($1-\beta=0.7421$). Once again, the usage of Cohen's small effects scale has been used to measure slight differences between factors. Although slightly lower than the standard of eighty percent, there is considerable power in the preliminary analysis of variance.

Next, the computation of the F statistic is commenced to determine the explained and unexplained variance between the factors which are independent of the indexed housing suitability measure. For the sake of austerity, the computed

TABLE XVIII
 Preliminary Analysis of Variance:
 Lone Parent Housing Suitability by Factors

Source of Variation	Sum of Squares	df	Mean Square	F-value	Significance of F
Occupation	5.762	4	1.440	2.001	0.094
Education	17.097	10	1.710	2.375	0.010
Gender	18.550	1	18.550	25.768	0.000
Age	13.870	6	2.312	3.211	0.005
Explained Effects	55.279	21	2.632	3.657	0.000
Residual Effects	218.846	304	0.720		
Total Variation	274.125	325	0.843		

Missing cases = 60.

results of the preliminary analysis of variance test statistic are presented within Table XVIII.

The results demonstrated within Table XVIII offer some interesting analyses. Obviously, the null hypothesis of no difference must be rejected as the F ratio for the explained variation is equal to 3.657 with twenty-one ($v_1=21$) degrees of freedom for the numerator and three hundred and four ($v_2=304$) degrees of freedom for the denominator. Moreover, it can be discerned that each of the independent variables have considerable explanatory strength within the equation as each derived F value is significant for the respective explained variance of that factor. Indeed, the explained effects

account for twenty percent (20.17%) of the total variation. Yet, there is considerable unexplained, residual variance which must be addressed to increase the usefulness of the model. In particular, the interaction between variables (higher order interactions) could explain some of the residual variation but there were no significant sum-of-squares results for the higher order interactions. In effect, the analysis must turn to further causative indicators in the development of a more parsimonious model which explains as much variation as possible. Therefore, the addition of the type of residential dwelling will be included within a secondary analysis of variance measure of housing suitability to improve the model for analysis and to increase the amount of explained variation derived therein.

Secondary Analysis of Variance: Lone Parent Housing Needs

The preliminary analysis of variance has demonstrated a number of particular findings. First, each factor of housing affordability was demonstrated to have considerable variation, which is significant in determining housing suitability for the lone parent family. Yet, the preliminary analysis of variance indicates that there is substantial residual variation which has yet to be explained. In order to improve the explanatory measure of the relationship between the housing affordability variables and the indexed housing

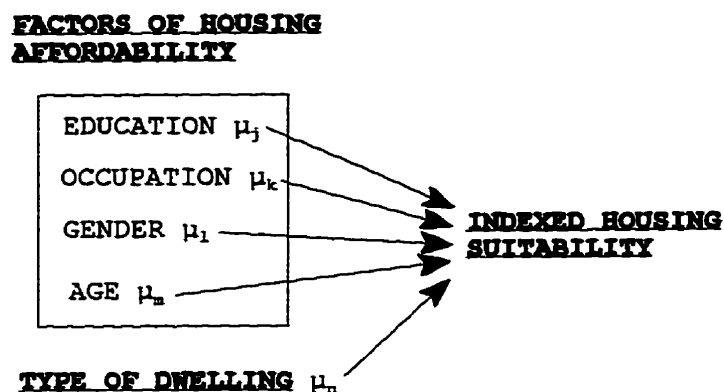
suitability, it would be appropriate to attempt the reduction of the residual variance with the introduction of an additional explanatory variable. As a result, the type of dwelling that the lone parent resides within will be considered for the application of the secondary analysis of variance. In effect, the inclusion of an additional independent variable will serve to determine more of the explained variance within the factors which effect housing suitability.

Although the conceptual framework presented within chapter two did not contemplate the possibility of dwelling type to be significant in the relationship of lone parent housing needs, the inclusion of the variable must be now reconsidered. Figure VII is a heuristic model which represents the inclusion of household type as an independent variable within the analysis of housing needs for the lone parent family.

The type of dwelling was recorded for each household within the respective Winnipeg Area Study survey years (see Appendix II). For each Winnipeg Area Study survey year, the valid response categories of dwelling type included the following values:

Single Detached House	01
Semi-Detached House	02
Duplex	03
Row House	04
Apartment, Less than Five Stories	05
Apartment, Five or More Stories	06
Dwelling Attached to Business	07

FIGURE VII
Secondary Assessment of Lone Parent Housing Needs



As the seventh category (Dwelling Attached to Business) had very little households within the total concatenated final sample ($n=5$) and only one lone parent family ($n=1$), the category was dropped and included within the no response category. As a result of the dropped category and a single missing response, there were three hundred and eighty-four ($n=384$) valid responses for lone parent families within the six response categories indicating the type of household dwelling. The cross-tabulation of household type by dwelling type for the complete Winnipeg Area Study concatenated final sample is reproduced within Appendix III.

Once the type of dwelling has been defined for inclusion in an analysis of variance, the technique can be implemented accordingly using the assumptions defined above. Moreover,

the null hypothesis from Equation IX is applicable for the secondary analysis of variance. Thus, the null hypothesis can be defined as one postulating no differences between the factors of housing affordability and household type in the determination of housing suitability for the lone parent family. As the level of confidence will be maintained at ninety-five percent ($\alpha=0.05$), the power of the statistical test must once again be calculated according to the principles outlined within Equation VIII. Once again, utilising the conservative measure associated with Cohen's small effects scale for the comparison of population variances, the probability of a Type II error can be determined to be twenty-six percent ($\beta=0.2616$).

As each of the requisite steps have been met or assumed to have been met, the secondary analysis of variance can be calculated. The results of the secondary analysis of variance are reproduced within Table XIX. As can be discerned from Table XIX, the null hypothesis of no difference between the factor variables can be rejected with a high probability ($p<0.000$) of assurance. Moreover, the addition of the type of dwelling by implication necessitates examination of the null hypothesis which postulates that there is no significantly additional variance explained. Again, the null hypothesis must be rejected as the type of household demonstrates a F value of twenty ($F=19.868$) with five degrees of freedom ($df=5$) which indicates a very high probability for of a subsequent

TABLE XIX
Secondary Analysis of Variance:
Lone Parent Housing Suitability by Factors

Source of Variation	Sum of Squares	df	Mean Square	F-value	Significance of F
Occupation	5.892	4	1.473	2.676	0.032
Education	16.784	10	1.678	3.049	0.001
Gender	17.535	1	17.535	31.852	0.000
Age	13.879	6	2.313	4.202	0.000
Dwelling	54.690	5	10.938	19.868	0.000
Explained Effects	108.781	26	4.184	7.600	0.000
Residual Effects	163.510	297	0.551		
Total Variation	272.291	323	0.843		

Missing cases = 62.

sample falling within the region of rejection ($p < 0.000$). In fact, the inclusion of the household dwelling type increases the amount of variance explained to forty percent (39.95%) of the total variation. Furthermore, the secondary analysis of variance improves the amount of variance explained by each of the independent ordinal variables of housing affordability upon the indexed housing suitability. In other words, the addition of the type of dwelling would appear to control some of the variance from the residual variation of the common variable.

The Analysis of Covariance: Measurement Assumptions

As it has become clear from the preceding analyses, the covariate interval measure of household income must be included within a test which concludes with a more complete analysis of housing needs for the lone parent family. In order to accommodate the inclusion of the interval level independent variable of household income in the assessment of lone parent family housing needs, the analysis of covariance technique will provide the required components from the linear regression technique and the analysis of variance technique. In particular, the analysis of covariance can provide an overall model to investigate the relationships and determine specific measures of the hypotheses from chapter two. As well, the degree to which each independent variable can facilitate explanation of the variance explained within the heuristic model from Figure V will become evident due to the following discussion.

As the hypotheses d) through f) from chapter two postulate directional statements of association, there is an explicit statement of linear relationship between housing need and housing affordability. In fact, with the level of variables including ordinal variables and the interval level covariate, the analysis of covariance can provide the necessary analysis of the variance explained to determine the degree of explanatory strength each independent variable contributes within the total equation.

The first assumption to be met considers the sampling methods discussed above. The groups which constitute the factors from the division of the independent variables must be derived from a random sample (Kirk, 1990: 471-475; Norušis, 1990a: 72-73). As demonstrated within chapter three, the sampling methodology of the Winnipeg Area Study utilised stratified simple random sampling techniques in each of the component years of the concatenated final sample. Furthermore, the analysis of covariance technique requires that thirty cases be available for each treatment ($np=30$) to ensure the variability between the factors. As a result of this sampling methodology, it can be argued that the sample was drawn using adequate randomisation.

The second assumption to be considered includes the variation of measures derived from the population in which the sample was selected. In effect, the Winnipeg Area Study concatenated final sample must have been drawn from normally distributed populations (Kirk, 1990: 471-475). Moreover, the possible contingency tables must also be assumed to have equal variances.

With this, the confidence of the test can be assessed through the demonstration of the level selected for the determination of actual significant differences between variables within the total model of analysis. As a result, the choice of α will comply with sociological convention and be established at a ninety-five percent ($1-\alpha=0.95$) level of

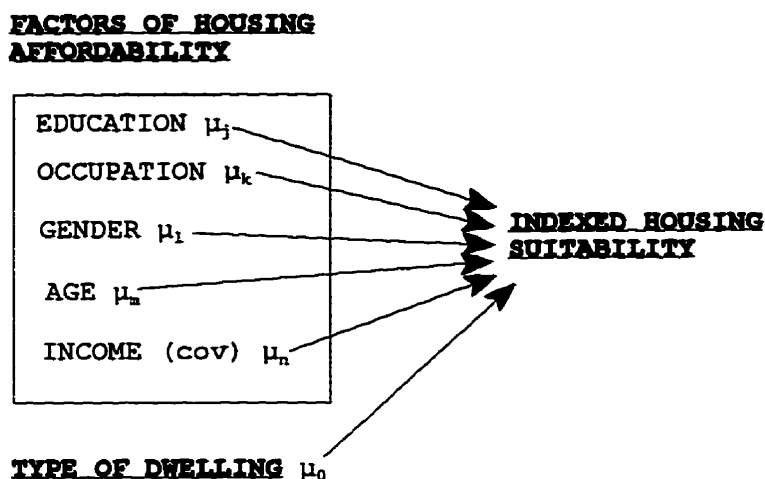
confidence. Finally, the last stage results in decomposition of the total variance into the two categories of explained and residual (unexplained) variance.

When many tests are done, the chance that some observed differences appear to be statistically significant when there are no true differences in the populations increases with the number of comparisons made. In particular, the usage of numerous higher order interactions result in the saturated model of analysis. As a result, the model will be limited to those interactions deemed significant by the derived measure of the F statistic for each respective factor and the total model.

The Analysis of Covariance: Lone Parent Housing Needs

In order to determine the relationship between the factors within the supplementary heuristic model presented in Figure VIII, the analysis of covariance technique has been executed utilising each of the variables composing housing affordability including the type of dwelling. The analysis of lone parent family housing needs can be sufficiently examined and the relationship between each of the variables can be demonstrated to have significant predictive measures within the total model. In order to sufficiently conduct an appropriate analysis of covariance statistical analysis, a few

FIGURE VIII
Tertiary Assessment of Lone Parent Housing Needs



related assumptions must be delineated in the application of the final analysis.

The determination of the final sample size is necessary to ensure if the treatments used are within reliable boundaries. The sample size equals three hundred and eighty-six ($n=386$) lone parent families. Yet, the number of lone parent families which have a measure missing on one of the values from the heuristic model within Figure VIII is equal to one hundred and forty-four cases ($n=144$). As the number of treatments equal six ($p=6$), the minimal necessary cases for the analysis of covariance can be said to have been adequately sampled from the concatenated final sample.

To facilitate the use of each of the lone parent families within the total Winnipeg Area Study concatenated final sample, the calculation of the test statistic has included the values for those cases without values recorded for one of the pertinent independent or dependent variables. That is, the analysis of covariance could incorporate the missing values for the calculation of the F statistic and sum-of-squares measures to improve the amount of variation explained. Therefore, to increase the amount of variability explained by the model, the missing cases (those respondents with a missing value on one or more variables) have been included within the final analysis.

The results within Table XX demonstrate a number of significant findings of the relationships postulated between the factors within the tertiary assessment of housing needs for the lone parent family. First, each of the variables from Figure VIII have been established within Table XX to be significant predictors for the variation within the total model of housing need. In particular, it should be noted that the amount of variation explained through first order interactions is equal to fifty-four percent (54.01%) of all the variation between lone parent families. Although second order and higher level interactions would serve to explain more of the observed variation, the number of factors limited the significance of any higher order interactions. In effect, an explanatory limitation has resulted due to the number of

TABLE XX
 Analysis of Covariance: Lone Parent Housing
 Suitability by Housing Affordability Factors

Source of Variation	Sum of Squares	df	Mean Square	F-value	Significance of F
Occupation	6.304	4	1.576	3.738	0.006
Education	11.538	10	1.154	2.737	0.003
Gender	11.531	1	11.531	27.350	0.000
Age	16.233	6	2.705	6.417	0.000
Type of Dwelling	49.332	5	9.866	23.401	0.000
Household Income (Cov)	14.305	1	14.305	32.910	0.000
Explained Effects	109.242	27	4.046	9.309	0.000
Residual Effects	93.016	214	0.435		
Total Variation	202.258	241	0.839		

Missing cases = 144.

cases impeding a more complete delineation of the variation within the complete model of Figure VIII.

The introduction of the household income as a covariate has considerably increased the power of the statistical test over the secondary analysis of variance model. The introduction of a common covariate has substantially reduced the unexplained effects, improved the explained variance, and improved the predictive ability for each independent variable on the housing suitability indexed measures. In effect, null

hypotheses d) through f) have been demonstrated to require rejection due to the results derived from application of the analysis of covariance as summarised within Table XX. As the household income explains an additional portion of the variance, the total model contributes to the explanation of fifty-four percent (54.01%) of the total variance.

Finally, it can be discerned from Table XX that each of the independent variables explain differing amounts of the total variation between lone parent families. In particular, it should be noted that the type of dwelling the lone parent family lived within accounted for the largest sum-of-squares measure found in the total model. Following this, the age of the lone parent and the lone parent household income respectively defined the next two significant levels of variation explained. Finally, the lone parent education, occupation, and gender each demonstrated significant amounts of variance explained within the total model. Therefore, the model can be said to have definitive explanatory ability which can be statistically validated.

CHAPTER FIVE:
SUMMARY OF FINDINGS AND DISCUSSION

Although the intention of the hypotheses from chapter two was to simply test the assumptions from the heuristic model within Figure V, the exploration of the possible relationships between socioeconomic variables multiplied throughout the course of the investigation. As a result, there are a number of statistically significant relationships derived from the Winnipeg Area Study concatenated final sample. In particular, the findings of the current study reveal some striking differences between men and women lone parent families living within the urban area of Winnipeg. Moreover, each of the socioeconomic variables postulated to indicate lone parent family housing needs have demonstrated significant findings. Therefore, it is necessary to review the analyses within the current study to provide for a coherent synopsis of lone parent family housing needs. Furthermore, the findings from the application of the analysis of variance and analysis of covariance techniques must be elaborated upon.

The purpose of the current chapter is to summarise the findings from the empirical analyses and to discuss what those findings mean for social policy and future research. To succinctly delineate each of the pertinent findings and

discussions, the following chapter will be divided into four distinct and separate sections.

First, the findings of the total study will be systematically presented for an explicit summary of the research. The bivariate relationships which are, or appear to be, significant in the understanding of lone parent family housing needs will be presented. This will include the inclusion of the tests of hypotheses utilised within the respective analysis. Second, a discussion of the policy implications of the findings from the current study will be undertaken. With this, discussion of ameliorative social policy and possible directions for legislation will be introduced. Third, the ensuing section will outline some of the research implications and future directions for evaluative research on the lone parent family and their housing needs. Finally, the study will conclude with a section allocated for some concluding remarks.

5.1 DISCUSSION OF SIGNIFICANT FINDINGS

Although the current study does not claim to be a panacea for lone parent housing needs, there are a considerable number of findings which are significant in their breadth and scope. Each of these findings can contribute somewhat to the epistemological development of family studies with particular attention to the housing needs of the lone parent family. The purpose of this section is to delineate the particular findings from the Winnipeg Area Study final concatenated sample which are apparently significant in the analysis of lone parent family housing needs. Furthermore, as the findings relate to the Canadian lone parent family, it is believed that each will contribute somewhat in the directions for policy development.

As each of the findings occur in various sections within the body of the text, this section will simply present a chronology of the findings which are significant in the explanation of housing needs for the lone parent family. With this, the significance of each will be discussed in terms of the relationships demonstrated between socioeconomic variables which determine the housing needs for the lone parent family. Finally, the hypotheses tested will be briefly presented so that each of the respective results can be reviewed within a coherent delineation for possible future research and subsequent policy development.

Obviously, the results of the current study do not present much promise for financial success of the lone parent family. In fact, the future aspirations of lone parent families are substantially limited by a number of factors, primarily the most important of which is the household income that the lone parent family can generate. Yet, there are substantial findings which present alternative causative explanations to simply addressing the monetary issue.

First, it was clearly demonstrated within the literature review that financial considerations were of the utmost importance for the lone parent successfully obtaining adequate, affordable, and suitable housing. In fact, with the application of the analysis of covariance statistical technique, the covariate of household income was demonstrated to be highly significant in the determination of housing suitability for the lone parent family. In effect, the designation of a single independent variable which predicts the ability of the lone parent family to obtain suitable housing rests with the income generated by that family. Yet, there do exist significant relationships with antecedent socioeconomic variables which serve to effect the housing suitability of the lone parent family within the urban area of Winnipeg.

Most certainly, the gender of the lone parent family head was demonstrated to be a definitive correlate to the income of the lone parent household. In fact, throughout the repeated

bivariate analyses in the measurement of the variables discussed and the subsequent tests of the hypotheses, control for the gender of the lone parent introduced a considerable number of significant relationships. Certainly, there were observed differences in education and occupation which were demonstrated through the analysis of covariance and chi-square measures to be highly significant between women and men lone parent families.

In particular, the household income rankings were considerably lower for women lone parent families than for men lone parent families. As well, household income was demonstrated to be significantly lower for lone parent families than two parent families. Yet, the age of the lone parent women played a particular role in the determination of these rankings as women lone parents were demonstrated to be significantly older than men lone parents. In fact, the disparity between lone parent women and men would appear to diminish with an increase in the age of the lone parent. This may be the result of a number of reasons which have not been explored within the current study.

As well as income differentials, the differences between household dwelling characteristics are interesting to note. First, the number of rooms in the household dwelling which a lone parent had was slightly higher in the Winnipeg Area Study final concatenated sample than that indicated from the census data. In part, this would likely be the result of a number of

higher income earners represented in the final concatenated sample due to the lack of stratification by family type. Moreover, as the percentage of lone parent families within the final concatenated sample was considerably lower than the national, provincial, or even urban area measures calculated by Statistics Canada (1993a), the inclusion of the outliers may have introduced a bias towards the more affluent lone parent families. In effect, the use of the Winnipeg Area Study as a secondary data source severely limits the investigation into the housing needs of the lone parent family.

Although a considerable amount of difference between lone parent families has been accounted for, there is consequential differences not clarified within the final analysis. For example, the literature review discussed the differences between lone parent families which result from legislative acts and custody decisions. Yet, there are little substantiated findings which clearly demonstrate that men are more likely to be within a financially secure situation prior to preceding with a custody challenge although it is commonly theorised within the literature (Greif, 1985). In fact, much of the unexplained variance within the final analysis of covariance model would likely be explained through further direct measurement of the various factors within an independent evaluation of lone parent housing needs or through

more stringent socioeconomic measures within the Winnipeg Area Study.

5.2 POLICY IMPLICATIONS OF THE FINDINGS

The policy implications of the findings from the current study can be vast in their scope or limited depending on the ameliorative approach one takes with regards to the results. For example, if it is accepted that income social assistance supplements or housing subsidies would alleviate the income differentials amongst lone parent families and between all family types, the policy required for the necessary change is straightforward. Simply put, social welfare income supplements would remove the barriers lone parents face in achieving adequate, affordable, and suitable housing. Yet, as it is obvious from the above discussion, income differentials are simply not the complete solution in understanding the divergent housing needs of the lone parent family.

As each level of government moves towards further fiscal restraint in rationalising expenditures and down-sizing public social programs, the avenues of financial assistance and housing subsidisation for the lone parent continue to diminish. McDaniel (1993: 204-205) has succinctly summarised the ideology surrounding the trend of the current fiscal policy as:

The concepts of deficit and affordability, as ideological constructs, are used to justify cutbacks in income maintenance payments to single mothers with dependent children or to alter the eligibility requirements for social programs, including essential unemployment insurance benefits. The ideology of deficit, in conjunction with strongly held beliefs about public spending, have revealed some implicit aspects of policies on single parents.

In essence these ideologies, which are driven by the political and social views of a liberal society reminiscent of neo-conservatism, tend to foster the ideology of individualism and competition above the connotations of community and cooperation.

Without exploring the discussions and implications pertinent to understanding societal ideologies driving the social welfare apparatus, it should be apparent from the above literature review that lone parent families are faced with considerable and ever increasing societal pressure to generate all the income necessary for the well-being of their family. In effect, lone parent families are increasingly being blamed for the failure of a social housing and welfare system to ensure a minimal standard of living for everyone within Canada. Furthermore, with the view that each individual lone parent is responsible for their own destiny, where does the ability of a post-industrial society to ensure a standard of living that is sufficient to meet the needs of all within the society? In particular, the contradiction between the social housing and welfare measures and the private housing markets must be addressed to reduce the housing needs and poverty found within the lone parent family.

Based on the empirical data and research findings, this thesis must conclude that a more complex policy response is required to address the housing problems experienced by lone parent families headed by women. Although the findings are

definitively limited by the usage of the secondary data source, they demonstrate that assessing the housing needs of the lone parent family is far more complex than the method currently utilised by the Canada Mortgage and Housing Corporation. Without a governmental re-evaluation of the current methods utilised to evaluate and distribute direct assistance to the lone parent family, current programs and services will continue to neglect the specific needs and complexities of lone parent families--in particular, children of lone parent families headed by women will be most affected. In essence, short term governmental response must ensure that subsidised housing monies continue to supplement the incomes of the lone parent family to alleviate the level of poverty and to foster domestic economic activity within the private housing sector. Furthermore, unlike the housing programs of the past (Rose, 1980), the government must ensure that the allocated monies are actually being utilised to provide the subsidisation of private sector housing. Finally, as the type of dwelling was very significant in the prediction of housing needs, long term government initiatives must be further developed to promote home ownership for the lone parent family.

Government initiatives, housing programs, and other social programs must incorporate multivariate methods of analysis to ensure that evaluations ultimately result in measurable improvements to the living standards of the lone

parent and their children. Without the introduction of more complete governmental analyses for addressing lone parent housing needs, the potentially severe social problems such oversight may generate is detrimental to Canadian society as a whole. The number of children living in poverty is considerable within Canada today and policy initiatives must be enacted to alleviate the burden of poverty from those too young to control their own destinies.

The research findings clearly indicate a means to employ more salient corrective policy and programmes. However, it should be noted that the method of analysis underscores the socioeconomic barriers that lone parent families headed by women face everyday but does not initiate the fundamental systemic change necessary to eliminate these and other barriers. The recognition of substantial systemic change in housing policies and social welfare is necessary if the social impacts and costs of lone parent family poverty are to be reversed. In effect, the long term strategy of government should move towards social housing policies similar to those implemented within the Scandinavian countries, particularly modelling programs based on the Swedish experience.

5.3 RESEARCH IMPLICATIONS OF THE FINDINGS

One limitation of this study is a truly comparative analysis with the census data for the urban area of Winnipeg, the province of Manitoba, and the nation as a whole. This limitation is due to the fact that access to census tape data is simply circumscribed by monetary resources. In effect, a considerable amount of money is required to obtain access to even the smallest data files from Statistics Canada. In fact, to have a specific table calculated to examine any two of the variables within the current study would have a starting cost of \$800 Canadian. As a result, the usage of census data was beyond the financial constraints of the current study and this method of analysis on a national scale and comparison with the Winnipeg Area Study was not possible due to the financial limitations of the current study. Therefore, future research would include such quantitative analyses using data derived from census computations.

The Winnipeg Area Study must continue to research the demographic and socioeconomic variables which facilitate research such as that herein. The Winnipeg Area Study must continue to survey the socioeconomic variables used previously and must reintroduce variables which have been recently dropped from the annual survey. In effect, the surveying of housing demographic indicators must include measures of the number of bedrooms and the number of rooms within the household. As well, the Winnipeg Area Study must develop a

more comprehensive strategy for an appropriate stratification of sampling frames by family type to ensure that distributions represent the demographic patterns evident from the census data. Furthermore, as housing adequacy measures have become more standardised, questions relevant to its measurement must be included within the Winnipeg Area Study.

Although the changes required for the Winnipeg Area Study data collection are easily obtainable, the changes necessary for the Winnipeg Area Study data files would be a considerable undertaking. The data collected and stored by the Winnipeg Area Study must be standardised through considerable effort to ensure that future replication and longitudinal analyses are facilitated much easier than was for the present study. Furthermore, the Winnipeg Area Study must consider developing more accurate interval level measures for variables surveyed to ensure that effective analyses can be performed to "achieve the highest level required because the lower level of measurement can be easily constructed for later analysis." (Ishii-Kuntz, 1994: 3). Finally, the Winnipeg Area Study must determine a means to continue funding survey research with the urban area of Winnipeg to ensure that families, and lone parent families, can be effectively polled on their beliefs, attitudes, socioeconomic, and demographic characteristics to ensure that policy can continue to be directed through empirical research.

5.4 CONCLUDING REMARKS

Obviously, the findings from the current research require immediate attention to alleviate the overwhelming problems faced by lone parent families and their children. In order to obtain affordable housing, there needs to be substantial changes to societal reactions to and opinions of the lone parent family. In particular, there is a real need for the development of equitable social policy which creates the equality of condition for all families through such mechanisms as universal housing programmes. Yet, in the political climate of today, it is unlikely that long term ameliorative policy will be developed to mitigate the barriers which lone parent families face in obtaining adequate, affordable, and suitable housing. Furthermore, it is also unlikely that any substantial initiatives will come from the private housing sector without direction from the Canadian or provincial governments as evident from the research conducted through institutions such as the C.D. Howe Institute (Fallis et al., 1995). The Federal and provincial governments must work to encourage housing development to improve the condition of the lone parent family and stimulate economic activity within the private housing market.

It is trusted that the findings and research methodology of the current study will serve to further the research into the lone parent family and their housing needs. As well, the need to share the findings of such research with the community

as a whole is paramount in adequately starting to address the challenges within Canadian society. In effect, the theory and research of the current study should pave the way for directed social action and social policy change to improve the housing situation for lone parent families and for all Canadians alike.

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APPENDIX I:
CONCATENATED WINNIPEG AREA STUDY
FINAL SAMPLE CODE WITH DICTIONARY

The following is the computer code used to create the total concatenated final sample from the Winnipeg Area Study over the period 1981 to 1991 inclusively. Any apparent discrepancies or unusual separations between computer code calculations are the result of insufficient computer resources and/or reproduction errors. The total number of computer input files were consolidated into the single file below using a number of jobs accordingly separated below. Each of the SPSS® program codes were implemented with the Unix version on the University of Manitoba platform. This release version was SPSS® 5.0 for Solaris 2.2. The statistical analyses were conducted through a Sun Sparc work-station. As well, secondary analyses were conducted through the University of Manitoba MVS platform and the University of Manitoba Computer Services personal computer (PC) platform servers. Each of the respective versions were licensed to the University of Manitoba.

The concatenated final sample was derived from the Winnipeg Area Study years from 1981 to 1991. These files were made available through the Winnipeg Area Study director. Each of the raw ascii data files were obtained from the University

of Manitoba and transferred to the Unix platform for the concatenation and necessary analysis. As well, the data were transferred to the MVS platform and PC after concatenation for additional and secondary analysis and file back-up. The concatenated codebook is presented within the first section of this appendix. Reproduction of the results can be made possible through the concatenation methods following in the second part of this appendix.

Concatenated Final Sample Dictionary

RESNUM	Respondent Number (3)
SURVYEAR	Year of Survey (2)
INTGEND	Interviewer Gender (1)
DESGEN	Designated Gender of Respondent (1)
INTLCALL	Initial Call (1)
CALLBK1	Call Back 1 (1)
CALLBK2	Call Back 2 (1)
CALLBK3	Call Back 3 (1)
CALLBK4	Call Back 4 (1)
CALLBK5	Call Back 5 (1)
CALLBK6	Call Back 6 (1)
CALLBK7	Call Back 7 (1)
INTMONTH	Month of Interview (1)
INTDATE	Date of Interview (2)
INTTIME	Time of Interview (4)
INTLGTH	Length of Interview (3)
ADULTS	Number of Adults in Household (2)
CHLDRN	Number of Children (2)
RESGEND	Gender of Respondent (1)
RESAGE	Age of Respondent (2)
GENMEM2	Gender of Member 2 (1)
AGEMEM2	Age of Member 2 (2)
RELMEM2	Relationship of Member 2 to Respondent (2)
GENMEM3	Gender of Member 3 (1)
AGEMEM3	Age of Member 3 (2)
RELMEM3	Relationship of Member 3 to Respondent (2)
GENMEM4	Gender of Member 4 (1)
AGEMEM4	Age of Member 4 (2)
RELMEM4	Relationship of Member 4 to Respondent (2)

GENMEM5	Gender of Member 5 (1)
AGEMEM5	Age of Member 5 (2)
RELMEM5	Relationship of Member 5 to Respondent (2)
GENMEM6	Gender of Member 6 (1)
AGEMEM6	Age of Member 6 (2)
RELMEM6	Relationship of Member 6 to Respondent (2)
GENMEM7	Gender of Member 7 (1)
AGEMEM7	Age of Member 7 (2)
RELMEM7	Relationship of Member 7 to Respondent (2)
GENMEM8	Gender of Member 8 (1)
AGEMEM8	Age of Member 8 (2)
RELMEM8	Relationship of Member 8 to Respondent (2)
GENMEM9	Gender of Member 9 (1)
AGEMEM9	Age of Member 9 (2)
RELMEM9	Relationship of Member 9 to Respondent (2)
LIVARRAN	Current Living Arrangement (1)
MREMPFT	Months Employed Full-time in Previous Year (2)
MREMPPT	Months Employed Part-time in Previous Year (2)
RESEMPFT	Employed Full-time (1)
RESEMPPT	Employed Part-time (1)
RESUEMPL	Unemployed: Looking for Work (1)
RESUEMPN	Unemployed: Not Looking for Work (1)
RRETIRE	Retired (1)
RSCHOOL	In School (1)
RKEEPHSE	Keeping House (1)
RRSCHLD	Raising Children (1)
RVOLUNWK	Volunteer Work (1)
ROTHERWK	Other Labour Situation (1)
RESPPM	PPM: Respondent (8.2)
RESSOC	Standard Occupation Code, Respondent (4)
NUMROOM	Number of Rooms in Household (2)
OWNDWELL	Household Member Own Dwelling? (1)
HINCOME	Household Income (2)
PINCOME	Individual Income (2)
HHINC	Household Income no index (6)
RESINC	Respondent Income no index (6)
RYRSCHL	Years of Schooling, Respondent (2)
REDLVL	Respondent Highest Education Level (2)
TYPEHSHD	Dwelling Type (1)
HHOLDSIZ	Size of Household (8.2)
HINIDX	Household Income Index Base 1986 (8.2)
RESINIDX	Respondent Income Index Base 1986 (8.2)
FAMTYPE	Type of Family (8.2)
CHILDREN	Are Children Present? (8.2)
CHLD1	Number of Children with Categories (8.2)
CHLD2	Number of Children in Families w/Child (8.2)
REDLVL2	Highest Level of Education Categories (8.2)
HHSUIT	Housing Suitability Scale (8.2)
RPPM	Recalculated Respondent PPM (8.2)
FAMTYPE3	Family Type by Children (8.2)
EDUC	Respondent Grouped Level of Education (8.2)
ROCCUP	Respondent Grouped Occupational Class (8.2)

Concatenated Final Sample Computer Input Code

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RELMEM8 RELMEM9 1 'Respondent' 2 'Spouse/Partner' 3 'Son'
4 'Daughter' 5 'Mother' 6 'Father' 7 'Sibling' 8 'Relative'
9 'Friend' 10 'Other' 97 'NA' 98 'DK' 99 'NR'.
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IF (VAR315 NE 6) RKEEPHSE=2.
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IF (VAR315 EQ 7) ROTHERWK=2.
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IF (VAR315 EQ 9) RESEMPPT=9.
IF (VAR315 EQ 9) RESUEMPL=9.
IF (VAR315 EQ 9) RRETIRE=9.
IF (VAR315 EQ 9) RSCHOOL=9.
IF (VAR315 EQ 9) RKEEPHSE=9.
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RKEEPHSE ROTHERWK 1 'yes' 2 'no' 9 'NR'.
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RKEEPHSE ROTHERWK (7, 9) RELMEM2 RELMEM3 RELMEM4 RELMEM5
RELMEM6 RELMEM7 RELMEM8 RELMEM9 HINCOME (97, 98, 99)

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(88=98).
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RELMEM8 RELMEM9 1 'Respondent' 2 'Spouse/Partner' 3 'Son'
4 'Daughter' 5 'Mother' 6 'Father' 7 'Sibling' 8 'Relative'
9 'Friend' 10 'Other' 97 'NA' 98 'DK' 99 'NR'.
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IF (VAR373 EQ 9) RESUEMPL=9.
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RKEEPHSE ROTHERWK 1 'yes' 2 'no' 9 'NR'.
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VALUE LABELS RELMEM2 RELMEM3 RELMEM4 RELMEM5 RELMEM6 RELMEM7
RELMEM8 RELMEM9 1 'Respondent' 2 'Spouse/Partner' 3 'Son'
4 'Daughter' 5 'Mother' 6 'Father' 7 'Sibling' 8 'Relative'
9 'Friend' 10 'Other' 97 'NA' 98 'DK' 99 'NR'.
MISSING VALUES RELMEM2 RELMEM3 RELMEM4 RELMEM5 RELMEM6 RELMEM7
RELMEM8 RELMEM9 (97, 98, 99) LIVARRAN (9).
IF (VAR002 NE 0) SURVYEAR=84.
IF (VAR179 EQ 1) RESEMPFT=1.
IF (VAR179 NE 1) RESEMPFT=2.
IF (VAR179 EQ 2) RESEMPPT=1.
IF (VAR179 NE 2) RESEMPPT=2.
IF (VAR179 EQ 3) RESUEMPL=1.
IF (VAR179 NE 3) RESUEMPL=2.
IF (VAR179 EQ 4) RRETIRE=1.
IF (VAR179 NE 4) RRETIRE=2.
IF (VAR179 EQ 5) RRSCHOOL=1.
IF (VAR179 NE 5) RRSCHOOL=2.
IF (VAR179 EQ 6) RKEEPHSE=1.
IF (VAR179 NE 6) RKEEPHSE=2.
IF (VAR179 EQ 7) ROTHERWK=1.
IF (VAR179 EQ 7) ROTHERWK=2.
IF (VAR179 EQ 9) RESEMPFT=9.
IF (VAR179 EQ 9) RESEMPPT=9.
IF (VAR179 EQ 9) RESUEMPL=9.
IF (VAR179 EQ 9) RRETIRE=9.
IF (VAR179 EQ 9) RRSCHOOL=9.
IF (VAR179 EQ 9) RKEEPHSE=9.
IF (VAR179 EQ 9) ROTHERWK=9.
VALUE LABELS RESEMPFT RESEMPPT RESUEMPL RRETIRE RRSCHOOL
RKEEPHSE ROTHERWK 1 'yes' 2 'no' 9 'NR'.
MISSING VALUES RESEMPFT RESEMPPT RESUEMPL RRETIRE RRSCHOOL
RKEEPHSE ROTHERWK (7, 9).

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SAVE
/OUTFILE='was84.sps'
/KEEP ALL.

```

```

GET
/FILE='was86.sps'
/KEEP ALL.
/RENAME (VAR027=RELMEM2) (VAR030=RELMEM3) (VAR033=RELMEM4)
(VAR036=RELMEM5) (VAR039=RELMEM6) (VAR042=RELMEM7)
(VAR045=RELMEM8) (VAR048=RELMEM9) (VAR053=LIVARRAN).
RECODE RELMEM2 RELMEM3 RELMEM4 RELMEM5 RELMEM6 RELMEM7 RELMEM8
RELMEM9 (0=97) (1=1) (2=2) (3=3) (4=4) (5=5) (6=6) (7=8) (8=9)
(9=99).
RECODE LIVARRAN (1=3) (2=1) (3=2) (4=4) (5=5) (6=6) (9=9).
MISSING VALUE RELMEM2 RELMEM3 RELMEM4 RELMEM5 RELMEM6 RELMEM7
RELMEM8 RELMEM9 (97, 98, 99) LIVARRAN (9).
IF (VAR272 EQ 1) RESEMPFT=1.
IF (VAR272 NE 1) RESEMPFT=2.
IF (VAR272 EQ 2) RESEMPPT=1.
IF (VAR272 NE 2) RESEMPPT=2.
IF (VAR272 EQ 3) RESUEMPL=1.
IF (VAR272 NE 3) RESUEMPL=2.
IF (VAR272 EQ 4) RRETIREDD=1.
IF (VAR272 NE 4) RRETIREDD=2.
IF (VAR272 EQ 5) RSCHOOL=1.
IF (VAR272 NE 5) RSCHOOL=2.
IF (VAR272 EQ 6) RKEEPHSE=1.
IF (VAR272 NE 6) RKEEPHSE=2.
IF (VAR272 EQ 7) ROTHERWK=1.
IF (VAR272 EQ 7) ROTHERWK=2.
IF (VAR272 EQ 9) RESEMPFT=9.
IF (VAR272 EQ 9) RESEMPPT=9.
IF (VAR272 EQ 9) RESUEMPL=9.
IF (VAR272 EQ 9) RRETIREDD=9.
IF (VAR272 EQ 9) RSCHOOL=9.
IF (VAR272 EQ 9) RKEEPHSE=9.
IF (VAR272 EQ 9) ROTHERWK=9.
VALUE LABELS RESEMPFT RESEMPPT RESUEMPL RRETIREDD RSCHOOL
RKEEPHSE ROTHERWK 1 'yes' 2 'no' 9 'NR'.
MISSING VALUES RESEMPFT RESEMPPT RESUEMPL RRETIREDD RSCHOOL
RKEEPHSE ROTHERWK (7, 9).
SAVE
/OUTFILE='was86.sps'
/KEEP=ALL.

```

```

GET
/FILE='was87.sps'
/KEEP ALL.
/RENAME (VAR027=RELMEM2) (VAR030=RELMEM3) (VAR033=RELMEM4)

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```

(VAR036=RELMEM5) (VAR039=RELMEM6) (VAR042=RELMEM7)
(VAR046=RELMEM8) (VAR049=RELMEM9) (VAR053=LIVARRAN)
(VAR123=RESPPM) (VAR164=HINCOME) (VAR165=PINCOME).
RECODE RELMEM2 RELMEM3 RELMEM4 RELMEM5 RELMEM6 RELMEM7 RELMEM8
RELMEM9 (0=97) (1=1) (2=2) (3=3) (4=4) (5=5) (6=6) (7=8)
(8=9) (9=99).
RECODE LIVARRAN (1=3) (2=1) (3=2) (4=4) (5=5) (6=6) (9=9).
RECODE RESPPM (0=97) (1=16) (2=15) (3=14) (4=13) (5=12) (6=11)
(7=10) (8=9) (9=8) (10=7) (11=6) (12=5) (13=4) (14=3) (15=2)
(16=1) (9494=98) (9999=99).
RECODE HINCOME PINCOME (0,4=1) (1=8) (2=3) (3=4) (5=2) (6=5)
(7=6) (8=9) (9=16) (10=19) (11=13) (12=14) (13=22) (14=23)
(97=97) (98=98) (99=99).
VALUE LABELS RELMEM2 RELMEM3 RELMEM4 RELMEM5 RELMEM6 RELMEM7
RELMEM8 RELMEM9 1 'Respondent' 2 'Spouse/Partner' 3 'Son'
4 'Daughter' 5 'Mother' 6 'Father' 7 'Sibling' 8 'Relative'
9 'Friend' 10 'Other' 97 'NA' 98 'DK' 99 'NR'.
VALUE LABELS LIVARRAN 1 'Married' 2 'Common-law' 3 'Single'
4 'Divorced' 5 'Separated' 6 'Widowed' 9 'NR'.
VALUE LABELS RESPPM 97 'NA' 98 'DK' 99 'NR'.
MISSING VALUES RELMEM2 RELMEM3 RELMEM4 RELMEM5 RELMEM6
RELMEM7 RELMEM8 RELMEM9 HINCOME PINCOME RESPPM (97, 98, 99)
LIVARRAN (9).
IF (VAR122 EQ 1) RESEMPFT=1.
IF (VAR122 NE 1) RESEMPFT=2.
IF (VAR122 EQ 2) RESEMPPT=1.
IF (VAR122 NE 2) RESEMPPT=2.
IF (VAR122 EQ 3) RESUEMPL=1.
IF (VAR122 NE 3) RESUEMPL=2.
IF (VAR122 EQ 4) RRETIRE=1.
IF (VAR122 NE 4) RRETIRE=2.
IF (VAR122 EQ 5) RSCHOOL=1.
IF (VAR122 NE 5) RSCHOOL=2.
IF (VAR122 EQ 6) RKEEPHSE=1.
IF (VAR122 NE 6) RKEEPHSE=2.
IF (VAR122 EQ 7) ROTHERWK=1.
IF (VAR122 EQ 7) ROTHERWK=2.
IF (VAR122 EQ 9) RESEMPFT=9.
IF (VAR122 EQ 9) RESEMPPT=9.
IF (VAR122 EQ 9) RESUEMPL=9.
IF (VAR122 EQ 9) RRETIRE=9.
IF (VAR122 EQ 9) RSCHOOL=9.
IF (VAR122 EQ 9) RKEEPHSE=9.
IF (VAR122 EQ 9) ROTHERWK=9.
VALUE LABELS RESEMPFT RESEMPPT RESUEMPL RRETIRE RSCHOOL
RKEEPHSE ROTHERWK 1 'yes' 2 'no' 9 'NR'.
MISSING VALUES RESEMPFT RESEMPPT RESUEMPL RRETIRE RSCHOOL
RKEEPHSE ROTHERWK (7, 9).
SAVE
/OUTFILE='was87.sps'
/KEEP ALL.

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```
GET
/FILE='was88.sps'
/KEEP=ALL.
/RENAME (VAR027=RELMEM2) (VAR030=RELMEM3) (VAR033=RELMEM4)
(VAR036=RELMEM5) (VAR039=RELMEM6) (VAR043=RELMEM7)
(VAR046=RELMEM8) (VAR049=RELMEM9).
RECODE RELMEM2 RELMEM3 RELMEM4 RELMEM5 RELMEM6 RELMEM7 RELMEM8
RELMEM9 (1=1) (2 THRU 6=2) (7,9=3) (8,10=4) (11,13=5)
(12,14=6) (15 THRU 18=7) (19 THRU 28=8) (29,30=9)
(31 THRU 33=10) (34=10) (77=97) (98=98) (99=99).
VALUE LABELS RELMEM2 RELMEM3 RELMEM4 RELMEM5 RELMEM6 RELMEM7
RELMEM8 RELMEM9 1 'Respondent' 2 'Spouse/Partner' 3 'Son'
4 'Daughter' 5 'Mother' 6 'Father' 7 'Sibling' 8 'Relative'
9 'Friend' 10 'Other' 97 'NA' 98 'DK' 99 'NR'.
MISSING VALUES RELMEM2 RELMEM3 RELMEM4 RELMEM5 RELMEM6 RELMEM7
RELMEM8 RELMEM9 (97, 98, 99).
SAVE
/OUTFILE='was88.sps'
/KEEP ALL.
```

ADD FILES

```
/FILE='was91.sps'
/RENAME (VAR001=RESNUM) (VAR002=SURVYEAR) (VAR003B=INTGEND)
(VAR006=DESGEN) (VAR007=INTLCALL) (VAR008=CALLBK1)
(VAR009=CALLBK2) (VAR010=CALLBK3) (VAR011=CALLBK4)
(VAR012=CALLBK5) (VAR013=CALLBK6) (VAR014=CALLBK7)
(VAR015=INTMONTH) (VAR016=INTDATE) (VAR017=INTTIME)
(VAR018=INTLGTH) (VAR019=RESYEAR) (VAR020=ADULTS)
(VAR021=CHLDRN) (VAR022=RESGEND) (VAR023=RESAGE)
(VAR025=GENMEM2) (VAR026=AGEMEM2) (VAR027=RELMEM2)
(VAR028=GENMEM3) (VAR029=AGEMEM3) (VAR030=RELMEM3)
(VAR031=GENMEM4) (VAR032=AGEMEM4) (VAR033=RELMEM4)
(VAR034=GENMEM5) (VAR035=AGEMEM5) (VAR036=RELMEM5)
(VAR037=GENMEM6) (VAR038=AGEMEM6) (VAR039=RELMEM6)
(VAR040=GENMEM7) (VAR041=AGEMEM7) (VAR042=RELMEM7)
(VAR043=GENMEM8) (VAR044=AGEMEM8) (VAR045=RELMEM8)
(VAR046=GENMEM9) (VAR047=AGEMEM9) (VAR048=RELMEM9)
(VAR087=LIVARRAN) (VAR089=MREMPFT) (VAR090=MREMPPT)
(VAR091=RESEMPFT) (VAR092=RESEMPPT) (VAR093=RRETIRED)
(VAR094=RESUEMPL) (VAR096=RKEEPHSE) (VAR097=RRSCHLD)
(VAR098=ROTHERWK) (VAR099=RSCHOOL) (VAR100=RVOLUNWK)
(VAR101=RESSOC) (VAR330=NUMROOM) (VAR335=HINCOME)
(VAR336=PINCOME) (VAR345=REDLVL) (VAR392=TYPEHSHD)
(PPMRESP=RESPPM)
/FILE='was90.sps'
/RENAME (VAR001=RESNUM) (VAR002=SURVYEAR) (VAR003B=INTGEND)
(VAR006=DESGEN) (VAR007=INITCALL) (VAR008=CALLBK1)
(VAR009=CALLBK2) (VAR010=CALLBK3) (VAR011=CALLBK4)
(VAR012=CALLBK5) (VAR013=CALLBK6) (VAR014=CALLBK7)
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(VAR015=INTMONTH) (VAR016=INTDATE) (VAR017=INTTIME)
(VAR018=INTLGTH) (VAR019=RESYEAR) (VAR020=ADULTS)
(VAR021=CHLDRN) (VAR022=RESGEND) (VAR023=RESAGE)
(VAR025=GENMEM2) (VAR026=AGEMEM2) (VAR027=RELMEM2)
(VAR028=GENMEM3) (VAR029=AGEMEM3) (VAR030=RELMEM3)
(VAR031=GENMEM4) (VAR032=AGEMEM4) (VAR033=RELMEM4)
(VAR034=GENMEM5) (VAR035=AGEMEM5) (VAR036=RELMEM5)
(VAR037=GENMEM6) (VAR038=AGEMEM6) (VAR039=RELMEM6)
(VAR041=GENMEM7) (VAR042=AGEMEM7) (VAR043=RELMEM7)
(VAR044=GENMEM8) (VAR045=AGEMEM8) (VAR046=RELMEM8)
(VAR047=GENMEM9) (VAR048=AGEMEM9) (VAR049=RELMEM9)
(VAR233=LIVARRAN) (VAR235=MREMPFT) (VAR236=MREMPPT)
(VAR237=RESEMPFT) (VAR238=RESEMPPT) (VAR239=RESUEMPL)
(VAR240=RESUEMPN) (VAR241=RRETIRE) (VAR242=RSCHOOL)
(VAR243=RKEEPHSE) (VAR244=RRSCHLD) (VAR245=RVOLUNWK)
(VAR246=ROTHERWK) (VAR247=RESPPM) (V247=RESSOC)
(VAR259=NUMROOM) (VAR264=HINCOME) (VAR265=PINCOME)
(VAR274=REDLVL) (VAR286=TYPEHSHD)
/FILE='was89.sps'
/RENAME (VAR001=RESNUM) (VAR002=SURVYEAR) (VAR006=DESGEN)
(VAR007=INITCALL) (VAR008=CALLBK1) (VAR009=CALLBK2)
(VAR010=CALLBK3) (VAR011=CALLBK4) (VAR012=CALLBK5)
(VAR013=CALLBK6) (VAR014=CALLBK7) (VAR015=INTMONTH)
(VAR016=INTDATE) (VAR017=INTTIME) (VAR018=INTLGTH)
(VAR019=RESYEAR) (VAR020=ADULTS) (VAR021=CHLDRN)
(VAR022=RESGEND) (VAR023=RESAGE) (VAR025=GENMEM2)
(VAR026=AGEMEM2) (VAR027=RELMEM2) (VAR028=GENMEM3)
(VAR029=AGEMEM3) (VAR030=RELMEM3) (VAR031=GENMEM4)
(VAR032=AGEMEM4) (VAR033=RELMEM4) (VAR034=GENMEM5)
(VAR035=AGEMEM5) (VAR036=RELMEM5) (VAR037=GENMEM6)
(VAR038=AGEMEM6) (VAR039=RELMEM6) (VAR041=GENMEM7)
(VAR042=AGEMEM7) (VAR043=RELMEM7) (VAR044=GENMEM8)
(VAR045=AGEMEM8) (VAR046=RELMEM8) (VAR047=GENMEM9)
(VAR048=AGEMEM9) (VAR049=RELMEM9) (VAR060=LIVARRAN)
(VAR201=MREMPFT) (VAR202=MREMPPT) (VAR204=RESEMPFT)
(VAR205=RESEMPPT) (VAR206=RESUEMPL) (VAR207=RESUEMPN)
(VAR208=RRETIRE) (VAR209=RSCHOOL) (VAR210=RKEEPHSE)
(VAR211=RVOLUNWK) (VAR212=ROTHERWK) (VAR227=RESSOC)
(VAR248=NUMROOM) (VAR255=HINCOME) (VAR256=PINCOME)
(VAR275=REDLVL) (VAR277=RYRSCHL) (VAR289=TYPEHSHD)
(FAMSIZE=HHOLDSIZ) (V227=RESPPM)
/FILE='was88.sps'
/RENAME (IDNUM=RESNUM) (VAR002=SURVYEAR) (VAR003B=INTGEND)
(VAR006=DESGEN) (VAR007=INTLCALL) (VAR008=CALLBK1)
(VAR009=CALLBK2) (VAR010=CALLBK3) (VAR011=CALLBK4)
(VAR012=CALLBK5) (VAR013=CALLBK6) (VAR014=CALLBK7)
(VAR015=INTMONTH) (VAR016=INTDATE) (VAR017=INTTIME)
(VAR018=INTLGTH) (VAR019=RESYEAR) (VAR020=ADULTS)
(VAR021=CHLDRN) (VAR022=RESGEND) (VAR023=RESAGE)
(VAR025=GENMEM2) (VAR026=AGEMEM2) (VAR028=GENMEM3)
(VAR029=AGEMEM3) (VAR031=GENMEM4) (VAR032=AGEMEM4)
(VAR034=GENMEM5) (VAR035=AGEMEM5) (VAR037=GENMEM6)

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(VAR038=AGEMEM6) (VAR041=GENMEM7) (VAR042=AGEMEM7)
(VAR044=GENMEM8) (VAR045=AGEMEM8) (VAR047=GENMEM9)
(VAR048=AGEMEM9) (VAR081=LIVARRAN) (VAR154=MREMPFT)
(VAR155=MREMPPT) (VAR157=RESEMPFT) (VAR158=RESEMPPT)
(VAR159=RESUEMPL) (VAR160=RESUEMPN) (VAR161=RRETIRE)
(VAR162=RSCHOOL) (VAR163=RKEEPHSE) (VAR164=RVOLUNWK)
(VAR166=RESPPM) (VAR227=HINCOME) (VAR228=PINCOME)
(VAR320=NUMROOM) (VAR345=REDLVL) (VAR347=RYRSCHL)
(VAR360=TYPEHSHD) (ROCCUP=RESSOC) (FAMSIZE=HHOLDSIZ)
/FILE='was87.sps'
/RENAME (IDNUM=RESNUM) (VAR003=SURVYEAR) (VAR007=DESGEN)
(VAR008=INTLCALL) (VAR009=CALLBK1) (VAR010=CALLBK2)
(VAR011=CALLBK3) (VAR012=CALLBK4) (VAR013=CALLBK5)
(VAR014=CALLBK6) (VAR015=CALLBK7) (VAR016=INTMONTH)
(VAR017=INTDATE) (VAR018=INTTIME) (VAR019=INTLGTH)
(VAR020=ADULTS) (VAR021=CHLDRN) (VAR022=RESGEND)
(VAR023=RESAGE) (VAR025=GENMEM2) (VAR026=AGEMEM2)
(VAR028=GENMEM3) (VAR029=AGEMEM3) (VAR031=GENMEM4)
(VAR032=AGEMEM4) (VAR034=GENMEM5) (VAR035=AGEMEM5)
(VAR037=GENMEM6) (VAR038=AGEMEM6) (VAR040=GENMEM7)
(VAR041=AGEMEM7) (VAR044=GENMEM8) (VAR045=AGEMEM8)
(VAR047=GENMEM9) (VAR048=AGEMEM9) (VAR120=MREMPFT)
(VAR121=MREMPPT) (VAR134=RESYEAR) (VAR136=REDLVL)
(VAR163=TYPEHSHD) (ROCCUP=RESSOC) (FAMSIZE=HHOLDSIZ)
/FILE='was86.sps'
/RENAME (VAR001=RESNUM) (VAR002=SURVYEAR) (VAR004=INTGEND)
(VAR008=INTLCALL) (VAR009=CALLBK1) (VAR010=CALLBK2)
(VAR011=CALLBK3) (VAR012=CALLBK4) (VAR013=CALLBK5)
(VAR014=CALLBK6) (VAR016=INTMONTH) (VAR017=INTDATE)
(VAR018=INTTIME) (VAR019=INTLGTH) (VAR020=ADULTS)
(VAR021=CHLDRN) (VAR022=RESGEND) (VAR023=RESAGE)
(VAR025=GENMEM2) (VAR026=AGEMEM2) (VAR028=GENMEM3)
(VAR029=AGEMEM3) (VAR031=GENMEM4) (VAR032=AGEMEM4)
(VAR034=GENMEM5) (VAR035=AGEMEM5) (VAR037=GENMEM6)
(VAR038=AGEMEM6) (VAR040=GENMEM7) (VAR041=AGEMEM7)
(VAR043=GENMEM8) (VAR044=AGEMEM8) (VAR046=GENMEM9)
(VAR047=AGEMEM9) (VAR054=NUMROOM) (VAR273=MREMPFT)
(VAR274=MREMPPT) (VAR275=RESSOC) (VAR283=RESYEAR)
(VAR284=REDLVL) (VAR297=HINCOME) (VAR298=PINCOME)
(VAR305=TYPEHSHD) (HTOTAL=HHOLDSIZ)
/FILE='was84.sps'
/RENAME (RESP=RESNUM) (VAR013=INTLCALL) (VAR014=CALLBK1)
(VAR015=CALLBK2) (VAR016=CALLBK3) (VAR017=CALLBK4)
(VAR018=CALLBK5) (VAR019=CALLBK6) (VAR009=INTMONTH)
(VAR010=INTDATE) (VAR011=INTTIME) (VAR012=INTLGTH)
(VAR024=ADULTS) (VAR025=CHLDRN) (VAR026=HHOLDSIZ)
(VAR027=RESGEND) (VAR028=RESAGE) (VAR030=GENMEM2)
(VAR031=AGEMEM2) (VAR033=GENMEM3) (VAR034=AGEMEM3)
(VAR036=GENMEM4) (VAR037=AGEMEM4) (VAR039=GENMEM5)
(VAR040=AGEMEM5) (VAR042=GENMEM6) (VAR043=AGEMEM6)
(VAR045=GENMEM7) (VAR046=AGEMEM7) (VAR048=GENMEM8)
(VAR049=AGEMEM8) (VAR051=GENMEM9) (VAR052=AGEMEM9)

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(VAR180A=MREMPFT) (VAR180B=MREMPPT) (VAR065=NUMROOM)
(VAR219=HINCOME) (VAR220=PINCOME) (VAR196=REDLVL)
(VAR267=TYPEHSHD)
/FILE='was83.sps'
/RENAME (VAR002=RESNUM) (VAR009=INTMONTH) (VAR010=INTDATE)
(VAR011=INTTIME) (VAR012=INTLGTH) (VAR018=ADULTS)
(VAR019=CHLDRN) (VAR020=HHOLDSIZ) (VAR021=RESGEND)
(VAR022=RESAGE) (VAR024=GENMEM2) (VAR025=AGEMEM2)
(VAR027=GENMEM3) (VAR028=AGEMEM3) (VAR030=GENMEM4)
(VAR031=AGEMEM4) (VAR033=GENMEM5) (VAR034=AGEMEM5)
(VAR036=GENMEM6) (VAR037=AGEMEM6) (VAR039=GENMEM7)
(VAR040=AGEMEM7) (VAR042=GENMEM8) (VAR043=AGEMEM8)
(VAR045=GENMEM9) (VAR046=AGEMEM9) (VAR056=NUMROOM)
(VAR374=MREMPFT) (VAR375=RESSOC) (VAR385=RESYEAR)
(VAR387=REDLVL) (VAR389=RYRSCHL) (VAR420=TYPEHSHD)
/FILE='was81.sps'
/RENAME (VAR002=RESNUM) (VAR009=INTMONTH) (VAR010=INTDATE)
(VAR011=INTTIME) (VAR012=INTLGTH) (VAR018=ADULTS)
(VAR019=CHLDRN) (VAR020=HHOLDSIZ) (VAR021=RESGEND)
(VAR022=RESAGE) (VAR024=GENMEM2) (VAR025=AGEMEM2)
(VAR027=GENMEM3) (VAR028=AGEMEM3) (VAR030=GENMEM4)
(VAR031=AGEMEM4) (VAR033=GENMEM5) (VAR034=AGEMEM5)
(VAR036=GENMEM6) (VAR037=AGEMEM6) (VAR039=GENMEM7)
(VAR040=AGEMEM7) (VAR042=GENMEM8) (VAR043=AGEMEM8)
(VAR045=GENMEM9) (VAR046=AGEMEM9) (VAR055=NUMROOM)
(VAR056=OWNDWELL) (VAR320=MREMPFT) (VAR321=MREMPPT)
(VAR426=REDLVL) (VAR428=RYRSCHL) (VAR491=TYPEHSHD)
/KEEP RESNUM SURVYEAR INTGEND DESGEN INITCALL CALLBK1 CALLBK2
CALLBK3 CALLBK4 CALLBK5 CALLBK6 CALLBK7 INTMONTH INTDATE
INTTIME INTLGTH RESYEAR ADULTS CHLDRN RESGEND RESAGE GENMEM2
AGEMEM2 RELMEM2 GENMEM3 AGEMEM3 RELMEM3 GENMEM4 AGEMEM4
RELMEM4 GENMEM5 AGEMEM5 RELMEM5 GENMEM6 AGEMEM6 RELMEM6
GENMEM7 AGEMEM7 RELMEM7 GENMEM8 AGEMEM8 RELMEM8 GENMEM9
AGEMEM9 RELMEM9 LIVARRAN MREMPFT MREMPPT RESEMPFT RESEMPPT
RESUEMPL RESUEMPN RRETIRED RSCHOOL RKEEPHSE RRSCHLD RVOLUNWK
ROTHERWK RESPPM RESSOC NUMROOM HINCOME PINCOME RYRSCHL REDLVL
TYPEHSHD HHOLDSIZ.
COMPUTE TEMPVAR2=RESSOC/1.
COMPUTE RPPM=TEMPVAR2/1.
RECODE RPPM (2141, 2343, 3111, 3113, 3115=1) (1171, 1173,
2111, 2112, 2114, 2131, 2133, 2142, 2143, 2144, 2145, 2146=2)
(1111, 1113, 1115, 1130 THRU 1135, 1147=3) (2163, 2164, 2183,
2319, 2333, 2339, 2349, 2399, 2519, 2719, 2739, 2791=4) (2117,
2135, 2165, 2169, 2353, 3155, 3156, 3157, 8116, 8146, 8176,
8336=5) (1116, 1119, 1123, 1136, 1141, 1142, 1143, 1145, 1149,
1174, 1175, 1176=6) (4110, 4130, 4140, 4150, 4160, 4170, 4190,
5170, 5190, 6120, 6130, 6160=7) (7311, 7510, 7710, 8110, 8130,
8150, 8160, 8230, 8250, 8260, 8290, 8310=8) (1137, 3133, 3134,
3337, 3339, 4111, 4131, 4143, 5131, 5133, 5171, 5172=9) (6112,
6113, 7511, 7516, 7517, 8131, 8133, 8137, 8141, 8143, 8151,
8155=10) (7113, 7115, 7119=11) (3139, 3159, 4113, 4133, 4135,
4137, 4139, 4151, 4153, 4155, 4157, 4159=12) (8563, 8566,

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8569, 8573, 8575, 8576, 8587, 8589, 8595, 8596, 8711, 8713=13)
 (4172, 4173, 4177, 4179, 4194, 4197, 4199, 5141, 5143, 5149,
 6129, 6139=14) (8715, 8718, 8719, 8738, 8798, 9139, 9155,
 9159, 9173, 9175, 9199, 9313=15) (7182, 7195, 7197, 7199=16)
 (4711, 5211, 9090, 9100, 9400, 9418, 9494, 9600, 9800,
 9997=97) (9998=98) (9999=99) (2147, 2153, 2155, 2157, 2160,
 2161, 2181, 2311, 2315, 2331, 2341, 2351=2) (2792, 2797, 2799,
 3119, 3130, 3131, 3137, 3153, 3154, 3311, 3314, 3315=4) (8396,
 8526, 8736, 8796, 9113, 9153, 2533, 3158, 3169, 9553=5) (1179,
 3370, 3371, 5191, 6141, 7131, 3360=6) (6190, 9910, 5130=7)
 (9110, 9130, 9170, 9190, 9510, 9530, 9550, 9590, 7180, 8210,
 8590, 9310=8) (5173, 5174, 5177, 9557, 3132, 4192=9) (8161,
 8163, 8167, 8231, 8311, 8313, 8316, 8333, 8335, 8351, 8376,
 8391=10) (4161, 4169, 4175, 4191, 4193, 4195, 5135, 5137,
 5179, 5199, 6123, 6125=12) (8319, 8331, 8334, 8339, 8353,
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VARIABLE LABELS RPPM 'Respondent PPM'.

VALUE LABELS RPPM 1 'Self-employed prof' 2 'Employed prof'

3 'High-level mgmt' 4 'Semi-professional' 5 'Technician'

6 'Middle mgmt' 7 'Supervisors' 8 'Foremen/women'

9 'Skilled cler-sale-serv' 10 'Skilled crafts/trades'

11 'Farmers' 12 'Semi-skilled cl-sa-se'

13 'Semi-skilled cr-tr' 14 'Unskilled cl-sa-se'

15 'Unskilled labourers' 16 'Farm labourers'.

MISSING VALUES RPPM (97,98,99).

COMPUTE HHINC=HINCOME/1.

COMPUTE RESINC=PINCOME/1.

```

RECODE HHINC RESINC (2=7000) (3=9000) (4=11000) (5=13000)
(6=15000) (7=17000) (8=19000) (9=21000) (10=23000)
(11=25000) (12=27000) (13=29000) (14=31000) (15=33000)
(16=35000) (17=37000) (18=39000) (19=42500) (20=47500)
(21=52500) (22=57500) (23=62500) (24=67500) (25=72500)
(26=77500) (1,27=999997) (98=999998) (99=999999).
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IF (SURVYEAR=81) RESINIDX=RESINC*1000/764.
IF (SURVYEAR=83) HHINIDX=HHINC*1000/887.
IF (SURVYEAR=83) RESINIDX=RESINC*1000/887.
IF (SURVYEAR=84) HHINIDX=HHINC*1000/919.
IF (SURVYEAR=84) RESINIDX=RESINC*1000/919.
IF (SURVYEAR=86) HHINIDX=HHINC.
IF (SURVYEAR=86) RESINIDX=RESINC.
IF (SURVYEAR=87) HHINIDX=HHINC*1000/1042.
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IF (SURVYEAR=88) HHINIDX=HHINC*1000/1085.
IF (SURVYEAR=88) RESINIDX=RESINC*1000/1085.
IF (SURVYEAR=89) HHINIDX=HHINC*1000/1137.
IF (SURVYEAR=89) RESINIDX=RESINC*1000/1137.
IF (SURVYEAR=90) HHINIDX=HHINC*1000/1189.
IF (SURVYEAR=90) RESINIDX=RESINC*1000/1189.
IF (SURVYEAR=91) HHINIDX=HHINC*1000/1250.
IF (SURVYEAR=91) RESINIDX=RESINC*1000/1250.
VALUE LABELS HHINC RESINC HHINIDX RESINIDX 999997 'Outliers'
999998 'DK' 999999 'NR'.
VARIABLE LABELS HHINC 'Hhld income no index'.
VARIABLE LABELS RESINC 'Resp income no index'.
VARIABLE LABELS HHINIDX 'Hhld income indexed'.
VARIABLE LABELS RESINIDX 'Resp income indexed'.
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IF (REDLVL EQ 7) EDUC = 2.
IF (REDLVL EQ 8) EDUC = 2.
IF (REDLVL EQ 10) EDUC = 2.
IF (REDLVL EQ 9) EDUC = 3.
IF (REDLVL GT 10) EDUC = 3.
IF (RPPM LE 4) ROCCUP = 1.
IF (RPPM GE 5 AND RPPM LE 8) ROCCUP = 2.
IF (RPPM GE 9 AND RPPM LE 13 AND RPPM NE 11) ROCCUP = 3.
IF (RPPM EQ 11) ROCCUP = 4.
IF (RPPM GE 14) ROCCUP = 4.
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RECODE GENMEM2 TO GENMEM9 (0,7=7).
RECODE AGEMEM2 TO AGEMEM9 (0,97,777=97).
RECODE TYPEHSHD INTMONTH LIVARRAN (0,9=9).
RECODE HHOLDSIZ (99,100,101=99).
RECODE HINCOME PINCOME (0,99=99).
RECODE REDLVL INTDATE RESYEAR (0,99=99).
RECODE RESSOC INTTIME (0,9999=9999).
RECODE INTLGTH (0,999=999).

```

```
RECODE RKEEPHSE RRSCHLD ROTHERWK (3,9=9) .
RECODE RESPPM (0,9090,9094,9494=99) .
MISSING VALUES INTGEND TYPEHSHD INTMONTH LIVARRAN (9) INTLGTH
(999) INTTIME RESSOC (9997,9998,9999) CALLBK1 CALLBK2 CALLBK3
CALLBK4 CALLBK5 CALLBK6 CALLBK7 GENMEM2 GENMEM3 GENMEM4
GENMEM5 GENMEM6 GENMEM7 GENMEM8 GENMEM9 RESEMPFT RESEMPPT
RESUEMPL RESUEMPN RRETIRE RRSCHLD RVOLUNWK
ROTHRWK (7,9) HHOLDSIZ RESAGE CHLDRN ADULTS RESYEAR INTDATE
NUMROOM (99) RELMEM2 RELMEM3 RELMEM4 RELMEM5 RELMEM6 RELMEM7
RELMEM8 RELMEM9 AGEMEM2 AGEMEM3 AGEMEM4 AGEMEM5 AGEMEM6
AGEMEM7 AGEMEM8 AGEMEM9 RESPPM (97,98,99) REDLVL MREMPPT
MREMPPT HINCOME PINCOME RYRSCHL (98,99) .
SAVE
/OUTFILE='was81-91.sps'
KEEP ALL.
```

APPENDIX II:

SELECTED VARIABLE FREQUENCIES:

CONCATENATED WINNIPEG AREA STUDY CODEBOOK, 1981-1991

SURVYEAR Winnipeg Area Study Survey Year

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
WAS 1981	81	336	7.2	7.2	7.2
WAS 1983	83	524	11.3	11.3	18.5
WAS 1984	84	573	12.3	12.3	30.8
WAS 1986	86	548	11.8	11.8	42.6
WAS 1987	87	581	12.5	12.5	55.1
WAS 1988	88	528	11.4	11.4	66.5
WAS 1989	89	521	11.2	11.2	77.7
WAS 1990	90	506	10.9	10.9	88.5
WAS 1991	91	533	11.5	11.5	100.0
	Total	4650	100.0	100.0	
Valid cases	4650	Missing cases	0		

INTGEND Interviewer Gender

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
Man	1	474	10.2	22.4	22.4
Woman	2	1639	35.2	77.6	100.0
Not measured	.	2535	54.5	Missing	
No response	9	2	0.0	Missing	
	Total	4650	100.0	100.0	
Valid cases	2113	Missing cases	2537		

DESGEN Designated Gender of Respondent

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
Man	1	1252	26.9	46.9	46.9
Woman	2	1417	30.5	53.1	100.0
Not measured	.	1981	42.6	Missing	
	Total	4650	100.0	100.0	
Valid cases	2669	Missing cases	1981		

INTMONTH Month of Interview

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
January	1	1279	27.5	27.5	27.5
February	2	2003	43.1	43.1	70.6
March	3	1107	23.8	23.8	94.5
April	4	219	4.7	4.7	99.2
May	5	37	0.8	0.8	100.0
June	6	1	0.0	0.0	100.0
Not measured	.	2	0.0	Missing	
No response	9	2	0.0	Missing	
	Total	4650	100.0	100.0	
Valid cases	4646		Missing cases	4	

NUMROOM Number of Rooms in the Household

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
	1	62	1.3	1.5	1.5
	2	104	2.2	2.6	4.1
	3	456	9.8	11.3	15.3
	4	544	11.7	13.4	28.8
	5	610	13.1	15.1	43.8
	6	715	15.4	17.6	61.5
	7	571	12.3	14.1	75.5
	8	471	10.1	11.6	87.2
	9	253	5.4	6.2	93.4
	10	160	3.4	3.9	97.4
	11	60	1.3	1.5	98.8
	12	28	0.6	0.7	99.5
	13	11	0.2	0.3	99.8
	14	2	0.0	0.0	99.9
	15	3	0.1	0.1	99.9
	16	1	0.0	0.0	100.0
	17	1	0.0	0.0	100.0
	21	1	0.0	0.0	100.0
	.	584	12.6	Missing	
No response	99	13	0.3	Missing	
	Total	4650	100.0	100.0	
Mean	5.937		Std dev	2.290	
Median	6.000		Mode	6.000	
Valid cases	4053		Missing cases	597	

INITCALL Initial Call Contact

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
None	1	432	9.3	42.1	42.1
Respondent	2	439	9.4	42.7	84.8
Other	3	156	3.4	15.2	100.0
Not measured	.	3623	77.9	Missing	
	Total	4650	100.0	100.0	
Valid cases	1027		Missing cases	3623	

CALLBK1 First Call Back Contact

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
None	1	914	19.7	34.2	34.2
Respondent	2	1483	31.9	55.6	89.8
Other	3	272	5.8	10.2	100.0
Not measured	.	1055	22.7	Missing	
Not applicable	7	918	19.7	Missing	
No response	9	8	0.2	Missing	
	Total	4650	100.0	100.0	
Valid cases	2669		Missing cases	1981	

CALLBK2 Second Call Back Contact

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
None	1	542	11.7	34.7	34.7
Respondent	2	871	18.7	55.8	90.5
Other	3	148	3.2	9.5	100.0
Not measured	.	1230	26.5	Missing	
Not applicable	7	1850	39.8	Missing	
No response	9	9	0.2	Missing	
	Total	4650	100.0	100.0	
Valid cases	1561		Missing cases	3089	

CALLBK3 Third Call Back Contact

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
None	1	350	7.5	38.9	38.9
Respondent	2	459	9.9	51.0	89.9
Other	3	91	2.0	10.1	100.0
Not measured	.	1315	28.3	Missing	
Not applicable	7	2431	52.3	Missing	
No response	9	4	0.1	Missing	
	Total	4650	100.0	100.0	
Valid cases	900	Missing cases	3750		

CALLBK4 Fourth Call Back Contact

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
None	1	223	4.8	40.0	40.0
Respondent	2	279	6.0	50.0	90.0
Other	3	56	1.2	10.0	100.0
Not measured	.	1370	29.5	Missing	
Not applicable	7	2719	58.5	Missing	
No response	9	3	0.1	Missing	
	Total	4650	100.0	100.0	
Valid cases	558	Missing cases	4092		

CALLBK5 Fifth Call Back Contact

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
None	1	133	2.9	39.7	39.7
Respondent	2	169	3.6	50.4	90.1
Other	3	33	0.7	9.9	100.0
Not measured	.	1397	30.0	Missing	
Not applicable	7	2916	62.7	Missing	
No response	9	2	0.0	Missing	
	Total	4650	100.0	100.0	
Valid cases	335	Missing cases	4315		

CALLBK6 Sixth Call Back Contact

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
None	1	82	1.8	38.1	38.1
Respondent	2	107	2.3	49.8	87.9
Other	3	26	0.6	12.1	100.0
Not measured	.	1412	30.4	Missing	
Not applicable	7	3021	65.0	Missing	
No response	9	2	0.0	Missing	
		-----	-----	-----	
	Total	4650	100.0	100.0	
Valid cases	215	Missing cases	4435		

CALLBK7 Seventh Call Back Contact

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
None	1	32	0.7	28.6	28.6
Respondent	2	74	1.6	66.1	94.6
Other	3	6	0.1	5.4	100.0
Not measured	.	1981	42.6	Missing	
Not applicable	7	2556	55.0	Missing	
No response	9	1	0.0	Missing	
		-----	-----	-----	
	Total	4650	100.0	100.0	
Valid cases	112	Missing cases	4538		

REGEND Gender of Respondent

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
Man	1	2050	44.1	44.1	44.1
Woman	2	2600	55.9	55.9	100.0
		-----	-----	-----	
	Total	4650	100.0	100.0	
Valid cases	4650	Missing cases	0		

CHLDRN Number of Children in the Residence

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
	0	2866	61.6	61.8	61.8
	1	740	15.9	16.0	77.7
	2	725	15.6	15.6	93.4
	3	231	5.0	5.0	98.3
	4	56	1.2	1.2	99.5
	5	14	0.3	0.3	99.8
	6	2	0.0	0.0	99.9
	7	2	0.0	0.0	99.9
	8	1	0.0	0.0	100.0
	9	1	0.0	0.0	100.0
	10	1	0.0	0.0	100.0
No response	99	11	0.2	Missing	
	Total	4650	100.0	100.0	
Mean	0.696		Std dev	1.052	
Valid cases	4639		Missing cases	11	

CHLD2 Number of Children in the Families with Children

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
	1	740	15.9	41.7	41.7
	2	725	15.6	40.9	82.6
	3	231	5.0	13.0	95.7
	4	56	1.2	3.2	98.8
	5	14	0.3	0.8	99.6
	6	2	0.0	0.1	99.7
	7	2	0.0	0.1	99.8
	8	1	0.0	0.1	99.9
	9	1	0.0	0.1	99.9
	10	1	0.0	0.1	100.0
	.	11	0.2	Missing	
Missing	99	2866	61.6	Missing	
	Total	4650	100.0	100.0	
Mean	1.822		Std dev	0.919	
Median	2.000		Mode	1.000	
Valid cases	1773		Missing cases	2877	

REDLVL Respondent Highest Level of Education

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
No schooling	1	12	0.3	0.3	0.3
Elem incomplete	2	89	1.9	1.9	2.2
Elem complete	3	69	1.5	1.5	3.7
Jnr high inc	4	222	4.8	4.8	8.5
Jnr high com	5	219	4.7	4.7	13.2
Hgh schl inc	6	779	16.8	16.9	30.1
Hgh schl com	7	1036	22.3	22.4	52.6
Non-univ inc	8	262	5.6	5.7	58.2
Non-univ com	9	650	14.0	14.1	72.3
Univ incomplete	10	459	9.9	9.9	82.3
Univ dipl/cert	11	123	2.6	2.7	84.9
Bachelor degree	12	527	11.3	11.4	96.3
Medical degree	13	21	0.5	0.5	96.8
Masters degree	14	127	2.7	2.8	99.5
Univ doctorate	15	21	0.5	0.5	100.0
Not measured	.	6	0.1	Missing	
Don't know	98	2	0.0	Missing	
No response	99	26	0.6	Missing	
	Total	4650	100.0	100.0	
Valid cases	4616		Missing cases	34	

RYRSCHL Respondent Years Schooling

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
Number of years		1892	40.7	100.0	100.0
Not measured	.	2746	59.1	Missing	
Don't know	98	2	0.0	Missing	
No response	99	10	0.2	Missing	
	Total	4650	100.0	100.0	
Mean	12.670	Median	12.000		
Std dev	3.678	Variance	13.528		
Valid cases	1892	Missing cases	2758		

EDUC Categorised Educational Level, Respondent

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
< High school	1	1390	29.9	30.1	30.1
High school	2	1757	37.8	38.1	68.2
Post sec educ	3	1469	31.6	31.8	100.0
.	.	34	0.7	Missing	
	Total	4650	100.0	100.0	
Valid cases	4616		Missing cases	34	

RESPPM Respondent Pineo Porter McRoberts Measure

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
Self-emp prof	1	23	0.5	0.8	0.8
Employed prof	2	313	6.7	10.8	11.6
Hi-level mgt	3	93	2.0	3.2	14.8
Semi-prof	4	273	5.9	9.4	24.3
Technician	5	63	1.4	2.2	26.4
Middle mgt	6	188	4.0	6.5	32.9
Supervisor	7	111	2.4	3.8	36.8
Foremen/women	8	71	1.5	2.5	39.2
Skilled c/s/s	9	392	8.4	13.5	52.8
Skilled cr/tr	10	234	5.0	8.1	60.9
Farmer	11	7	0.2	0.2	61.1
Semi-sk c/s/s	12	497	10.7	17.2	78.3
Semi-sk manual	13	242	5.2	8.4	86.7
Unskill c/s/s	14	166	3.6	5.7	92.4
Unskill manual	15	200	4.3	6.9	99.3
Farm labourer	16	20	0.4	0.7	100.0
Not applicable	97	1086	23.4	Missing	
No response	99	671	14.4	Missing	
	Total	4650	100.0	100.0	
Valid cases	2893		Missing cases	1757	

RPPM Lone Parent Pineo Porter McRoberts Measure

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
Self-emp prof	1	1	0.3	0.3	0.4
Employed prof	2	20	5.2	8.5	9.0
Hi-level mgt	3	6	1.6	2.6	11.5
Semi-prof	4	23	6.0	9.8	21.4
Technician	5	3	0.8	1.3	22.6
Middle mgt	6	14	3.6	6.0	28.6
Supervisor	7	9	2.3	3.8	32.5
Foremen/women	8	5	1.3	2.1	34.6
Skilled c/s/s	9	30	7.8	12.8	47.4
Skilled cr/tr	10	11	2.8	4.7	52.1
Farmer	11	0	0.0	0.0	52.1
Semi-sk c/s/s	12	64	16.6	27.4	79.5
Semi-sk manual	13	15	3.9	6.4	85.9
Unskill c/s/s	14	14	3.6	6.0	91.9
Unskill manual	15	18	4.7	7.7	99.6
Farm labourer	16	1	0.3	0.4	100.0
Not applicable	97	143	37.0	Missing	
No response	99	9	2.3	Missing	
Total		386	100.0	100.0	
Valid cases	234	Missing cases		152	

TYPEHSHD Dwelling Type of Respondent

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
Single house	1	2942	63.3	63.8	63.8
Semi-detached	2	156	3.4	3.4	67.2
Duplex	3	175	3.8	3.8	71.0
Row house	4	187	4.0	4.1	75.1
Apt < 5 stories	5	665	14.3	14.4	89.5
Apt ≥ 5 stories	6	476	10.2	10.3	99.8
Other	9	41	0.9	Missing	
Total		4650	100.0	100.0	
Valid cases	4609	Missing cases		41	

APPENDIX II:

SELECTED VARIABLE FREQUENCIES:

CONCATENATED WINNIPEG AREA STUDY CODEBOOK, 1981-1991

SURVYEAR Winnipeg Area Study Survey Year

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
WAS 1981	81	336	7.2	7.2	7.2
WAS 1983	83	524	11.3	11.3	18.5
WAS 1984	84	573	12.3	12.3	30.8
WAS 1986	86	548	11.8	11.8	42.6
WAS 1987	87	581	12.5	12.5	55.1
WAS 1988	88	528	11.4	11.4	66.5
WAS 1989	89	521	11.2	11.2	77.7
WAS 1990	90	506	10.9	10.9	88.5
WAS 1991	91	533	11.5	11.5	100.0
	Total	4650	100.0	100.0	
Valid cases	4650	Missing cases	0		

INTGEND Interviewer Gender

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
Man	1	474	10.2	22.4	22.4
Woman	2	1639	35.2	77.6	100.0
Not measured	.	2535	54.5	Missing	
No response	9	2	0.0	Missing	
	Total	4650	100.0	100.0	
Valid cases	2113	Missing cases	2537		

DESGEN Designated Gender of Respondent

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
Man	1	1252	26.9	46.9	46.9
Woman	2	1417	30.5	53.1	100.0
Not measured	.	1981	42.6	Missing	
	Total	4650	100.0	100.0	
Valid cases	2669	Missing cases	1981		

INTMONTH Month of Interview

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
January	1	1279	27.5	27.5	27.5
February	2	2003	43.1	43.1	70.6
March	3	1107	23.8	23.8	94.5
April	4	219	4.7	4.7	99.2
May	5	37	0.8	0.8	100.0
June	6	1	0.0	0.0	100.0
Not measured	.	2	0.0	Missing	
No response	9	2	0.0	Missing	
	Total	4650	100.0	100.0	

Valid cases	4646	Missing cases	4
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NUMROOM Number of Rooms in the Household

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
	1	62	1.3	1.5	1.5
	2	104	2.2	2.6	4.1
	3	456	9.8	11.3	15.3
	4	544	11.7	13.4	28.8
	5	610	13.1	15.1	43.8
	6	715	15.4	17.6	61.5
	7	571	12.3	14.1	75.5
	8	471	10.1	11.6	87.2
	9	253	5.4	6.2	93.4
	10	160	3.4	3.9	97.4
	11	60	1.3	1.5	98.8
	12	28	0.6	0.7	99.5
	13	11	0.2	0.3	99.8
	14	2	0.0	0.0	99.9
	15	3	0.1	0.1	99.9
	16	1	0.0	0.0	100.0
	17	1	0.0	0.0	100.0
	21	1	0.0	0.0	100.0
	.	584	12.6	Missing	
No response	99	13	0.3	Missing	
	Total	4650	100.0	100.0	

Mean	5.937	Std dev	2.290
Median	6.000	Mode	6.000
Valid cases	4053	Missing cases	597

INITCALL Initial Call Contact

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
None	1	432	9.3	42.1	42.1
Respondent	2	439	9.4	42.7	84.8
Other	3	156	3.4	15.2	100.0
Not measured	.	3623	77.9	Missing	
	Total	4650	100.0	100.0	
Valid cases	1027		Missing cases	3623	

CALLBK1 First Call Back Contact

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
None	1	914	19.7	34.2	34.2
Respondent	2	1483	31.9	55.6	89.8
Other	3	272	5.8	10.2	100.0
Not measured	.	1055	22.7	Missing	
Not applicable	7	918	19.7	Missing	
No response	9	8	0.2	Missing	
	Total	4650	100.0	100.0	
Valid cases	2669		Missing cases	1981	

CALLBK2 Second Call Back Contact

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
None	1	542	11.7	34.7	34.7
Respondent	2	871	18.7	55.8	90.5
Other	3	148	3.2	9.5	100.0
Not measured	.	1230	26.5	Missing	
Not applicable	7	1850	39.8	Missing	
No response	9	9	0.2	Missing	
	Total	4650	100.0	100.0	
Valid cases	1561		Missing cases	3089	

CALLBK3 Third Call Back Contact

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
None	1	350	7.5	38.9	38.9
Respondent	2	459	9.9	51.0	89.9
Other	3	91	2.0	10.1	100.0
Not measured	.	1315	28.3	Missing	
Not applicable	7	2431	52.3	Missing	
No response	9	4	0.1	Missing	
	Total	4650	100.0	100.0	
Valid cases	900	Missing cases	3750		

CALLBK4 Fourth Call Back Contact

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
None	1	223	4.8	40.0	40.0
Respondent	2	279	6.0	50.0	90.0
Other	3	56	1.2	10.0	100.0
Not measured	.	1370	29.5	Missing	
Not applicable	7	2719	58.5	Missing	
No response	9	3	0.1	Missing	
	Total	4650	100.0	100.0	
Valid cases	558	Missing cases	4092		

CALLBK5 Fifth Call Back Contact

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
None	1	133	2.9	39.7	39.7
Respondent	2	169	3.6	50.4	90.1
Other	3	33	0.7	9.9	100.0
Not measured	.	1397	30.0	Missing	
Not applicable	7	2916	62.7	Missing	
No response	9	2	0.0	Missing	
	Total	4650	100.0	100.0	
Valid cases	335	Missing cases	4315		

CALLBK6 Sixth Call Back Contact

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
None	1	82	1.8	38.1	38.1
Respondent	2	107	2.3	49.8	87.9
Other	3	26	0.6	12.1	100.0
Not measured	.	1412	30.4	Missing	
Not applicable	7	3021	65.0	Missing	
No response	9	2	0.0	Missing	
	Total	4650	100.0	100.0	
Valid cases	215	Missing cases	4435		

CALLBK7 Seventh Call Back Contact

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
None	1	32	0.7	28.6	28.6
Respondent	2	74	1.6	66.1	94.6
Other	3	6	0.1	5.4	100.0
Not measured	.	1981	42.6	Missing	
Not applicable	7	2556	55.0	Missing	
No response	9	1	0.0	Missing	
	Total	4650	100.0	100.0	
Valid cases	112	Missing cases	4538		

RESGEND Gender of Respondent

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
Man	1	2050	44.1	44.1	44.1
Woman	2	2600	55.9	55.9	100.0
	Total	4650	100.0	100.0	
Valid cases	4650	Missing cases	0		

CHLDRN Number of Children in the Residence

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
	0	2866	61.6	61.8	61.8
	1	740	15.9	16.0	77.7
	2	725	15.6	15.6	93.4
	3	231	5.0	5.0	98.3
	4	56	1.2	1.2	99.5
	5	14	0.3	0.3	99.8
	6	2	0.0	0.0	99.9
	7	2	0.0	0.0	99.9
	8	1	0.0	0.0	100.0
	9	1	0.0	0.0	100.0
	10	1	0.0	0.0	100.0
No response	99	11	0.2	Missing	
	Total	4650	100.0	100.0	
Mean	0.696		Std dev	1.052	
Valid cases	4639		Missing cases	11	

CHLD2 Number of Children in the Families with Children

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
	1	740	15.9	41.7	41.7
	2	725	15.6	40.9	82.6
	3	231	5.0	13.0	95.7
	4	56	1.2	3.2	98.8
	5	14	0.3	0.8	99.6
	6	2	0.0	0.1	99.7
	7	2	0.0	0.1	99.8
	8	1	0.0	0.1	99.9
	9	1	0.0	0.1	99.9
	10	1	0.0	0.1	100.0
	.	11	0.2	Missing	
Missing	99	2866	61.6	Missing	
	Total	4650	100.0	100.0	
Mean	1.822		Std dev	0.919	
Median	2.000		Mode	1.000	
Valid cases	1773		Missing cases	2877	

REDLVL Respondent Highest Level of Education

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
No schooling	1	12	0.3	0.3	0.3
Elem incomplete	2	89	1.9	1.9	2.2
Elem complete	3	69	1.5	1.5	3.7
Jnr high inc	4	222	4.8	4.8	8.5
Jnr high com	5	219	4.7	4.7	13.2
Hgh schl inc	6	779	16.8	16.9	30.1
Hgh schl com	7	1036	22.3	22.4	52.6
Non-univ inc	8	262	5.6	5.7	58.2
Non-univ com	9	650	14.0	14.1	72.3
Univ incomplete	10	459	9.9	9.9	82.3
Univ dipl/cert	11	123	2.6	2.7	84.9
Bachelor degree	12	527	11.3	11.4	96.3
Medical degree	13	21	0.5	0.5	96.8
Masters degree	14	127	2.7	2.8	99.5
Univ doctorate	15	21	0.5	0.5	100.0
Not measured	.	6	0.1	Missing	
Don't know	98	2	0.0	Missing	
No response	99	26	0.6	Missing	
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	Total	4650	100.0	100.0	

Valid cases	4616	Missing cases	34
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RYRSCHL Respondent Years Schooling

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
Number of years		1892	40.7	100.0	100.0
Not measured	.	2746	59.1	Missing	
Don't know	98	2	0.0	Missing	
No response	99	10	0.2	Missing	
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	Total	4650	100.0	100.0	

Mean	12.670	Median	12.000
Std dev	3.678	Variance	13.528
Valid cases	1892	Missing cases	2758

EDUC Categoriased Educational Level, Respondent

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
< High school	1	1390	29.9	30.1	30.1
High school	2	1757	37.8	38.1	68.2
Post sec educ	3	1469	31.6	31.8	100.0
.	.	34	0.7	Missing	
	Total	4650	100.0	100.0	
Valid cases	4616		Missing cases	34	

RESPPM Respondent Pineo Porter McRoberts Measure

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
Self-emp prof	1	23	0.5	0.8	0.8
Employed prof	2	313	6.7	10.8	11.6
Hi-level mgt	3	93	2.0	3.2	14.8
Semi-prof	4	273	5.9	9.4	24.3
Technician	5	63	1.4	2.2	26.4
Middle mgt	6	188	4.0	6.5	32.9
Supervisor	7	111	2.4	3.8	36.8
Foremen/women	8	71	1.5	2.5	39.2
Skilled c/s/s	9	392	8.4	13.5	52.8
Skilled cr/tr	10	234	5.0	8.1	60.9
Farmer	11	7	0.2	0.2	61.1
Semi-sk c/s/s	12	497	10.7	17.2	78.3
Semi-sk manual	13	242	5.2	8.4	86.7
Unskill c/s/s	14	166	3.6	5.7	92.4
Unskill manual	15	200	4.3	6.9	99.3
Farm labourer	16	20	0.4	0.7	100.0
Not applicable	97	1086	23.4	Missing	
No response	99	671	14.4	Missing	
	Total	4650	100.0	100.0	
Valid cases	2893		Missing cases	1757	

RPPM Lone Parent Pineo Porter McRoberts Measure

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
Self-emp prof	1	1	0.3	0.3	0.4
Employed prof	2	20	5.2	8.5	9.0
Hi-level mgt	3	6	1.6	2.6	11.5
Semi-prof	4	23	6.0	9.8	21.4
Technician	5	3	0.8	1.3	22.6
Middle mgt	6	14	3.6	6.0	28.6
Supervisor	7	9	2.3	3.8	32.5
Foremen/women	8	5	1.3	2.1	34.6
Skilled c/s/s	9	30	7.8	12.8	47.4
Skilled cr/tr	10	11	2.8	4.7	52.1
Farmer	11	0	0.0	0.0	52.1
Semi-sk c/s/s	12	64	16.6	27.4	79.5
Semi-sk manual	13	15	3.9	6.4	85.9
Unskill c/s/s	14	14	3.6	6.0	91.9
Unskill manual	15	18	4.7	7.7	99.6
Farm labourer	16	1	0.3	0.4	100.0
Not applicable	97	143	37.0	Missing	
No response	99	9	2.3	Missing	
	Total	386	100.0	100.0	
Valid cases	234		Missing cases	152	

TYPEHSHD Dwelling Type of Respondent

Value Label	Value	Freq	Percent	Valid Percent	Cum Percent
Single house	1	2942	63.3	63.8	63.8
Semi-detached	2	156	3.4	3.4	67.2
Duplex	3	175	3.8	3.8	71.0
Row house	4	187	4.0	4.1	75.1
Apt < 5 stories	5	665	14.3	14.4	89.5
Apt ≥ 5 stories	6	476	10.2	10.3	99.8
Other	9	41	0.9	Missing	
	Total	4650	100.0	100.0	
Valid cases	4609		Missing cases	41	

APPENDIX III:

SELECTED VARIABLE TABULATIONS:

CONCATENATED WINNIPEG AREA STUDY, 1981-1991

RPPM Lone Parent PPM by RESGEND Gender of Respondent

Respondent Pineo-Porter-McRoberts	Men	Women	Row Total Percentage
Self-Employed (1)	0	1	0.4
Employed Prof (2)	4	16	8.5
Hgh-level Mgt (3)	2	4	2.6
Semi-prof (4)	4	19	9.8
Technician (5)	0	3	1.3
Middle Mgt (6)	1	13	6.0
Supervisor (7)	1	8	3.8
Foremen/women (8)	2	3	2.1
Skill c/s/s (9)	4	26	12.8
Skill cr/tr (10)	10	1	4.7
Farmers (11)	0	0	0.0
Semi-sk c/s/s (12)	11	53	27.4
Semi-sk cr/tr (13)	5	10	6.4
Unskill c/s/s (14)	3	11	6.0
Unskill labour (15)	9	9	7.7
Farm Labourer (16)	1	0	0.4
Column Percentage	24.4	75.6	n = 234

Number of Missing Observations 152

TYPEHSHD Dwelling Type of Lone Parent Respondent by Gender

Type of Dwelling	Lone Parent Family Women	Lone Parent Family Men	Other Family Type w/child	One Adult w/o child	Two Adults w/o child	Row Total
Single House	137	65	1132	608	985	2927
Semi-Detached	24	1	70	24	35	154
Duplex	13	4	52	58	48	175
Row House	42	5	55	46	37	185
Apt <5 stories	70	5	49	416	120	660
Apt ≥5 stories	13	5	21	339	95	473
Total by Family	299	85	1379	1491	1320	4574

Number of Missing Observations 76