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Living Arrangements of The Elderly: A Canadian Study

Frances Miller-Kessner

A Thesis

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ABSTRACT

Living Arrangements Of The Elderly: A Canadian Study

Frances Miller-Kessner

This study focuses on the effects of selected variables on the living arrangements of the elderly in Canada. Two theoretical frameworks are presented and combined: the economic approach which encompasses the concept of preferences, resources, and prices, and the life cycle perspective which enables comparisons to be made at specific stages.

The Individual File of the Public Use Sample Tapes of the 1981 Canadian Census was used as the source of data. The variables considered as determinants of living arrangements were: place of residence, age, education, mother tongue, religion, ethnicity and income. Separate analyses were carried out for four groups: 1) single females, 2) single males, 3) separated, divorced and widowed females, and 4) separated, divorced, and widowed males. Log linear and regression were used as complimentary methods of analysis.

In the log linear analyses, the model with the best fit was found to be the one which included all of the independent variables as affecting living arrangements with each being conditionally independent of one another. When education was introduced into the basic model, the sex variable was neutralized. Sex was influenced by religion,

ethnic origin and mother tongue as well.

Separate regression analyses were then carried out on each of the four groups. There were no significant results for either male or femalie single persons. For the ever-married, income had the strongest impact on living arrangements, thus, supporting the main hypothesis of this study.

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TABLE OF CONTENTS

page

LIST OF TABLES

page

CHAPTER I

INTRODUCTION

1.1 Significance Of The Research

Relative recent advances in medical technology have had a tremendous impact on the composition of today's population. The percentage of the aged is expected to increase markedly in the next century as a result of two demographic trends: the lower birth rate and increasing life expectancy (Treas, 1976).

Due to the variation of the birth rate in recent decades in Canada accompanied by fluctuations in the rate of immigration to Canada and by a continued decline in death rates, the size and composition of the population has changed markedly increasing the numbers of aged within the population. (Denton and Spencer, 1981.) As a result of these changes, a wide range of social issues and problems related to the elderly will need to be addressed. One such important area of research which only recently has received some attention is the living arrangements of the elderly. Michael, Fuchs and Scott (1980) state that "one of the most profound but relatively neglected changes of recent decades has been the increase in the proportion of adults who live alone."

The purpose of this thesis is to investigate the living arrangements of the elderly in Canada as of 1981. The investigative force behind the writing of this paper is

twofold: Firstly, the relative newness of social gerontology as a discipline - the term was introduced into the literature by C. Tibbitts, for the first time in 1954 (Donahue, 1960). Secondly, the lack of empirical studies specifically on living arrangements of the elderly based on Canadian data. Most of the analyses which have been conducted in this area are based on U.S. data. It is but in the last decade that Canadian sociologists and demographers have begun to focus on the topic of living arrangements.

1.2 The Rationale Of The Research

Research has dispelled much of the myth of the multi-generational household in the present context but has confirmed that, in the past, this was the dominant pattern of living arrangements. According to Haraven (1974), "solitary residence was most uncommon throughout the nineteenth century in all age groups." She goes on to explain that "except for Western frontier communities and mining towns (in the United States), only about three to five percent of the population were found to be living alone" (Laslett and Wall, 1971; Haraven, 1974). Old people striving to remain in charge of their own households took in strangers or relatives.

There is clear evidence that the living arrangements of the elderly have changed considerably. In Canada, in 1971, 35.3 percent of non-family persons aged 65 and over

lived alone in private households, while 44 percent of non-family persons aged 65 years and over lived with other persons and 8.4 percent were institutionalized (Stone and Fletcher, 1980).

According to Soldo and Lauriat (1976) these trends can be generally characterized as "slight decreases in the incidence of living with relatives, and of most interest, sizeable increases in the incidence of primary individuals. (i.e. those living as heads of their own households and for the most part, alone) and those institutionalized." They go on to emphasize that these trends are "particularly strong among the very old, i.e. those over seventy-five years of age" (Soldo and Lauriat, 1976). Because the number of persons living in single-person households has increased fivefold in Canada since the early 1950's, many groups have experienced changes in living arrangements.

1.3 The Research Question

The area of living arrangements cannot be satisfactorily examined without giving special attention to two influencing factors, sex and marital status.

In 1921, five out of every one hundred Canadians were aged sixty-five (65) and over. If the birth rate remains constant, at the present rate, by the year 2031, 18 percent of Canadians will be aged sixty-five and over (Stone and Fletcher, 1980). According to Stone and Fletcher (1980),

"one of the most striking features in the changing profile of Canada's older population is the substantial and growing imbalance in numbers between females and males." In the first half of the century, males outnumbered females, but since 1961, females are more predominant in the population. It is projected that in the decades ahead, even if the rates of increase in population remain the same, the numbers of older females will greatly exceed the projected increase in the numbers of older males: males 65-and-over will constitute 6.6 percent of the population in 2051 (compared with 3.8 percent in 1976) and females in the 65-and-over group will constitute 11.0 percent, -- compared with 4.9 percent in 1976 (Denton and Spencer, 1979). The socialization process for males and females differes so that the elderly women view the household as their main area of responsibility. With almost twice as many females as males over age 65, sex will certainly have an impact on living arrangements.

Marital status, too, has been recognized as an important factor of living arrangements. Frances E. Kobrin (1976) proposes that marital status had a definite impact on the headship of a household. Geoffrey Carliner (1975), also, found that among unmarrieds, marital status was one of the most important influencing factors of household headship.

This study will analyze the living arrangements of the elderly separately for different sex and marital status

categories. The following chapter presents the theoretical framework of this paper. The economic approach and the family life cycle approach are both examined. The influence of sex and marital status as controls on the relationship between key determinants and living arrangement will also be discussed.

CHAPTER II

THE THEORETICAL FRAMEWORK

2.1 Introduction

As a result of its rapid growth, the elderly population is quickly becoming recognized as a segment worthy of investigation. Social psychologists have become involved in measuring the emotional adjustment (or lack of adjustment) of the elderly to old age, retirement, isolation and loneliness. The social welfare of the elderly has been examined by Shanas, (1969) and the effects of changes in the household on the family processes has been investigated (Goode, 1963). Most of the research done in this area has focused on the psychological aspects and has attempted to ascertain whether the basic psychological and emotional needs of the elderly are met. The theme of dependency is a recurring one. The qualitative nature of one's dependence or independence presents difficulty when attempting to measure it. Unlike a quantitative variable, independence has a subjective element. For this study, independence with regard to living arrangements can be viewed as living separately. According to Lawton (1980) there are different degrees of separateness dependent upon whether one lives alone or with spouse or kin.

Beresford and Rivlin (1966) state that today "individuals as well as nuclear families have succeeded in

obtaining not only more housing and better housing but housing separate from other people." This is reflected even among unmarried people by an "increase in the proportion of primary individuals (persons maintaining their own households apart from relatives)". There is, however, no greater tendency to separate living among the elderly than for any other age specific group. The big increase in the number of older households in recent years, according to Beresford and Rivlin (1966) was primarily a result of the increase in the proportion of older persons in the population, not a radical shift in the living arrangements of older people.

2.1.1. An Economic Approach

Economists are now beginning to investigate pension plans, social security and consumer items for the elderly. Sociologists, too, are awakened to the growing need to recognize the potency of this group; the many facets of life which they affect as well as the factors which affect them.

Most studies on living arrangements have either explicitly or implicity used the microeconomic theory as an explanatory framework. The economic approach is not always dependent upon the component of money but can be synonymous with an approach which assumes the rationality of behaviour in general. This integrated approach embraces most

sociological as well as economic variables within its three basic concepts: preferences, resources, and prices.

Preferences can be defined as "what is preferred or choice" (Allee, 1974). This preference with regard to living arrangements can be influenced by a multitude of independent variables. One's place of residence, mother tongue, religion, ethnicity or education can all either simultaneously or individually influence whether or not one will desire to live alone. These variables, then, can affect the preferences which one has with regard to living arrangements. Over the years they have been tempered towards the acceptance of separate living arrangements, and today, they serve as marked influences upon the decision of an individual to live alone.

There has been a change in socially accepted norms or individual preferences with regard to living arrangements, emphasizing a higher relative value on privacy and independence as opposed to companionship and mutual help (Wister, 1984). This has resulted in greater age segregation and increased isolation of the elderly. This increased isolation, according to the "modernization theory" is due to the decline of the position of the elderly within the family and society over generations (Cowgill, 1974). A more recent interpretation of the modernization theory exhibits this isolation as "welcome gains" in privacy (Kobrin, 1981). The modernization theory, thus, can be incorporated into the economic approach when viewed thusly.

Resources are defined as "pecuniary means; funds; wealth" (Allee, 1974). This concept can be represented by the income which one earns. Income is a determining factor of whether one can or cannot support the lifestyle which one desires.

Price, the third element of the economic approach is defined as "the amount at which a thing is valued, bought, or sold; value; cost" (Allee, 1974). Price is determined by the availability of the physical locations for the elderly. In urban areas, where approximately 75% of the aged reside, facilities are scarce thus increasing the price of housing (Shulman, 1980). In rural areas, the elderly tend to co-reside with kin reducing the demand for separate living arrangements and, thus, lowering the price. Hence, price is related to living arrangements.

These three components provide the essential ingredients of the economic theory and embrace most of the variables needed to describe the living arrangements of the elderly. Preferences, resources and prices shall be discussed in more detail in Chapter III.

2.1.2. The Family Life Cycle Approach

Many researchers have observed that within one's life several important changes or shifts occur which affect not only one's physical resources but one's emotional needs as well (Waite, 1980). These changes interact not only with

economic and social factors but with cultural ones as well (Haraven, 1978). These shifts are somewhat cylical in nature as they serve not only to affect the individual's behaviour but also are affected by the individual. Proponents of the family life cycle approach (Waite, 1980; Haraven, 1978; Glick and Parke, 1969; and others) often explain changes in lifestyle by the individual's position in the family life cycle.

Several typologies of the family life cycle have been developed. The most frequently used is the "six stage model" proposed by Glick (1947). Stage 1 commences with the period of first marriage to the birth of the first child. The "Expanding Circle Stage" (Stage 2) is from the birth of the first child to the birth of the last child. This is followed by the "Full House Plateau" which starts with the birth of the last child and lasts until the first child leaves home. Stage 4, "Shrinking Cycle" occurs from the first child leaving home to the last child leaving home. The "Empty Nest Syndrome" (Stage 5) commences with the last child leaving home and ends with the death of one spouse. The sixth and final stage takes place from the death of one spouse to the death of the remaining spouse.

Glick's model outlines the stages of the family life cycle by considering either the addition or the subtraction of persons from within the family unit. Elder (1977) explains the family life cycle stages in a similar manner. He identifies three basic criteria of family life cycle

stages:

1) Changes in family size.

2) Changes in family age composition and

3) The father's (or family head's) retirement from the work force (this differentiates the post-parental stage from the old age stage) (Elder, 1977).

The usefulness of this model is evident. Elder's categories are important when considering the living arrangements of the elderly. The marital status history of an individual, with a change in family size due to separation, divorce or widowhood is expected to affect the living arrangements of the elderly. Hence, marital status will be considered as an indicator of life cycle stage in this study and the analyses of the effects of the explanatory variables on living arrangements will be conducted separately for each life cycle stage. Age in this study, shall be used as an independent variable to explain living arrangements. The empirical model to be discussed in Chapter IV will be based on microeconomic theory which postulates that resources, preferences and prices contitute the determining factors of living arrangements.

The model to be developed in Chapter IV combines both theoretical frameworks. The economic approach provides the framework for the empirical specification of living arrangements, while the family life cycle approach enables a comparison of living arrangements to be made at two specific stages of the life cycle.

CHAPTER III

LITERATURE REVIEW

3.1 Introduction

This chapter deals with empirical studies which have been conducted on living arrangements and is divided into three sections, i.e. studies focusing on preferences, resources, and prices.

3.1.1 Previous Studies: Preferences

Carliner (1975) attributes the increase in headship rates to be in part a "question of taste." This preference has led to a search for privacy which, in turn, has forced the development of new terminology in the field of sociology. The concept of 'modified extended family' was created to accommodate those individuals who live separately but still maintain family ties (Sussman, 1959). According to Frances Kobrin (1976A), " 'independence' and 'privacy' are the usual reasons given for living separately."

Michael et al. (1980) reject the explanation of the rise in separate living arrangements to be due to 'tastes' but rather take an economic standpoint. They "view the decision to live alone as a reflection of an economic demand for privacy or autonomy" (Michael et al. 1980). Even though

Beresford and Rivlin (1966) use tastes or preferences as a device to compensate for an inexplicable and unanswerable question, they indicate that a "... 'change in taste' is the economist's phrase for something he is unable to explain" (Beresford and Rivlin, 1966).

There is a growing school of thought which supports the notion that Americans and Canadians have undergone a "fundamental cultural change in values, norms or preferences ("tastes" with regard to privacy and independence)" (Burch et al. 1983). The concept of "privacy" as a consumer product which has increased in demand has been introduced by Beresford and Rivlin (1966). They interpret privacy to mean "the occupancy by an individual or a nuclear family of a separate dwelling unit not shared by other relatives or non-relatives" (Beresford and Rivlin, 1966). They go on to state that "since World War II, Americans have expressed these preferences by using part of their rising income to buy privacy" (Beresford and Rivlin, 1966). This preference to live alone seems to have coincided with rising income. Wister (1985) notes that this preference would be encouraged by a "reluctance of adult children to accomodate their elderly parents".

Others view changing preferences as a function of modernization. Although modernization theory tends to emphasize the loss of status of the elderly as a factor which isolates them, Chevan and Korson (1975) define this phenomenon of 'family modernization' as an "adoption of a set of norms, attitudes, and

values which lead to changes in family structure." They go on to explain that certain family stuctures inevitably emerge as these subculture groups modernize (Chevan and Korson, 1975). According to Smith, (1981) a side effect for the elderly due to the structural changes of "family modernization", is a loss of status that was once associated with age. This loss is attributed to the "rising proportion of the population in older age groups, the impact of compulsory retirement, the emergence of mass influence, and the development of the welfare state as an alternative to the family" (Smith, 1981).

Kobrin recently (1981) suggests that, perhaps there is no loss of position but rather, that the elderly are welcoming the opportunity for their preferred, increased privacy.

Education, according to Chevan and Korson (1972) influences living arrangements. This, too, can serve to determine what preferences one would have. According to Chevan and Korson (1972), the greater the educational attainment of the individual, the greater the preference to live alone.

3.1.2 Previous Studies: Resources

As indicated in the previous section, Beresford and Rivlin (1966) attempt to explain the increase in separate living arrangements in terms of a shift in tastes, around

1940. But Michael et al, (1980) indicate that neither Beresford and Rivlin nor they are satisfied with that explanation. They attribute the rise in separate living arrangements to be clearly due to the rise in income. They substantiate this claim by pointing out that the relationship between income and the propensity to live alone is not linear but has an an S-shaped pattern to the relationship, thus, implying that "as incomes grew from very low levels the impact on living alone was slight but after some level of income was attained further increases in income have led to a substantial rise in the propensity to live alone" (Michael et all, 1980). Burch et al. (1983) in contrast to Michael et al's study, found, that the only significant variable in their longitudinal study was education. Burch et al. explain this by citing Preston and Richards (1975) who acknowledge that "variables can operate differently in cross-sectional than in longitudinal relationships."

Chevan and Korson (1972) found that "education exerts an independent influence on living alone, separate from the influence of income." They also found that "the joint effect of both income and education is additive." This results in the widowed with high income and high educational achievement being more apt to live alone than those with lower income and lower educational achievement.

Soldo and Lauriat (1976) also found that the relationship between age and living arrangements is highly

dependent upon level of personal income. This finding supports the theoretical positions of Soldo and Lauriat that "income acts to constrain the choice of living arrangements, at all ages, of the elderly."

Beresford and Rivlin, also, agree that the rise in separate living arrangements is a direct result of the rise in income which enabled individuals to afford separate apartments or homes. Michael et al. (1980) concur with this viewpoint but indicate that a certain threshold level of income was necessary (as a point of departure) before the relationship between income and living arrangements could emerge.

Another study by Carliner (1975) similarly indicates that "as income rises, the likelihood of headship for unmarried people should increase." Carliner was unable to differentiate between households containing one or two pensioners, thus producing some distortion in his analysis. He acknowledges this fault but concludes that "this serious shortcoming not withstanding, the results of measuring the effect of earnings alone on headship were encouraging. He goes on to explain that "in every regression, the earnings coefficient was positive and highly significant" (Carliner, 1975). He, too, then substantiates the effect of earnings on headship.

3.1.3 Previous Studies: Prices

According to the economic theory of supply and demand, the greater the demand for the goods or services, everything else constant, the higher the price. Michael et al. (1980) state that "as the number of persons living alone begins to increase significantly economic and political markets respond in ways that encourage further increases." They go on to cite examples such as 'single portion food products' as well as the construction of more one bedroom and efficiency apartments. In keeping with the theory of supply and demand, these adjustments occur in urbanized areas and result in more available housing for the elderly. The net effect lowers the price of living alone. Burch et al. (1983) agree that the price of living alone has been lowered "due to market adjustments to the sheer increase in the number of persons doing so (living alone)." The demand for separate housing has been overly accommodated by the supply, which, in turn, has lowered the price.

3.2 Other Constraints On Options Of Living Arrangements

The living arrangements of the elderly are also influenced by other factors which must be addressed. The availability of kin, the chronological age of the individual, his or her health status, sex and the marital status are other variables which may have an impact on living arrangements and should be incorporated in an

empirical model. These variables will be discussed in this chapter.

3.2.1 The Availability of Kin

Riley et al. (1968) indicated that only about three percent of non-institutionalized people over the age of 65 are kinless. Another three percent who are institutionalized probably have no kin to care for or about them (Townsend, 1962; 1965). It is important to note that about twenty percent of the 65 and over population are childless (Johnson and Catalano, 1981). To accommodate this situation, a social support pattern called the 'principle of substitution' has recently been identified (Shanas, 1979). This principle emphasizes the primacy of filial support. However, it can be extended to suggest that older people will substitute close relationships with more remote kin when children are not available. This is yet further extended to non-kin when kin are not available (Cicerelli, 1979). Shanas (1979) agrees that "older people are more likely to turn to family, then to friends and neighbours, and last to social and government agencies, particularly when sickness strikes."

The decline in fertility has had an impact on the availability of another option with respect to living arrangements. Using American data, Frances E. Kobrin (1976A) suggests that one reason why women aged 55 and over, who were married previously, but are presently either separated,

divorced or widowed tend to live alone is due to a decline in the number of adult daughters with whom they may live. The main theme of her discussion reflects a cyclical effect. Older females' options for living arrangements are dependent upon the past fertility of these same women. Thus, these women are responsible to themselves for the provision of their living arrangements.

As a result of the decline in the fertility rate as well as a decline in the mortality rate, the age of the parents when they will be in the 'empty nest' stage is younger than before. Glick and Parker (1965) concluded that the "effect of the increase in survivorship has been to increase greatly the proportion of couples enjoying many years of married life after the last child leaves home." This has increased the porportion of two-person households in 1950 (Kobrin, 1976B). This pattern is even more visible today as a result of an even greater decrease in mortality and fertility (Denton and Spencer, 1979). This stage precedes the last stage of the family cycle, i.e. widowhood.

Chevan and Korson (1972) found that "living arrangements are seen as a clue to the family system within which the widowed operate.. living arrangements may be ignored by kin or may be seized upon as a vehicle for demonstrating family solidarity and responsibility." Living arrangements are influenced by the family history prior to widowhood. The availability of children or

relatives with whom the widowed can live or interact directly influences living arrangements while the relationships that develop between parents and their children have an indirect effect (Chevan and Korson, 1972).

Harrison (1980) agrees that "a decrease in the number of children ever-born is likely to result in a contraction of the opportunity structure for living arrangements during widowhood and in increased propensity to live alone."

Troll (1971) acknowledges that almost everyone has some kind of kin but the contact with the kin is of utmost importance. Residential propinquity to kin, the actual physical geographical distance is a main determinant of living arrangements. All the studies which Troll (1971) cites reveal unanimously that older people, whenever possible, preferred to "live in their own homes and not with their children. This was particularly true, if they (the parents) were married" (Troll, 1971). Moving in with the children was seen as a last resort: e.g. in instances where the elderly were failing in health and where self-care was impossible or when a spouse dies or when they were financially incapable.

3.2.2 Age

Age is sometimes correlated with the family life cycle stage experiences but in this study it will be used as an independent variable. The emphasis on the age factor in today's society and the acceptance and gearing of our

society towards youth, have isolated the elderly, thus affecting the living arrangements. (A prime example of an attempt to establish an ideal aged community is Merrill Court) (Hochschild, 1973).

Tindale and Marshall (1980) discuss age-stratification with some theorizing about social class. Riley, Johnson and Foner (1972) view age strata as cutting across class strata, through the ordering of people and roles. "Thus, each age stratum is composed of people similar in age or life stage, who tend to share capacities, abilities, and motivations related to age. Age is also a criterion for entering or leaving roles and for the different rewards and obligations associated with these roles. In short, age is a basis of 'structured social inequality' (Foner, 1974). Age stratification might be examined when investigating living arrangements.

Separate living arrangements are seen as a result of the decline of the nuclear family as a focus of primary relationships. According to Frances E. Kobrin (1976), an increasing number of persons are living outside of kin relationships. Because of a growing concentration of this pattern of living within certain age groups, living with members of a family is now becoming a life cycle event of childhood and marriage years. Thus, if one is neither a child or a spouse, he/she is unlikely to live with other types of relatives. It can be noted, here, that because persons are leaning more towards their own age groups, young

people, who have, in the past, left their parental home for marriage tend today to obtain separate living arrangements before marriage as a sign of premarital independence, (Kobrin, 1976A).

3.2.3 Sex

According to the Demographic Yearbook of Canada (1982) the life expectancy of women at birth in 1975-77 was 77.48 years as compared to men at 70.19 years. The element of survivorship as evidenced by this difference in life expectancies will produce an excess of elderly widowed women in need of living accommodations.

Frances Kobrin (1976A) states that "more than 10 percent of American women eighteen years and over, and one-third (1/3) of those 65 and over were living alone or with non-relatives as heads of separate households in 1970. These compare with 1940 levels of 4 and 13 percent. It is worth noting that in Canada, in 1971, 24.2 percent of non-family females aged 65 and over were living alone in private households (Stone and Fletcher, 1980). By 2001, the number of non-family households headed by females is projected to be more than twice its size in 1971. The highest growth rates in the number of non-family households headed by older persons are expected to occur in Quebec, Ontario, Alberta and British Columbia, the most urbanized provinces (Stone and Fletcher, 1980).

In their study on living arrangements of the elderly in the United States, both Soldo and Lauriat (1976) found sex

to be the single, strongest determinant of living arrangements. Given their different life experiences, the living arrangements of men and women may be significantly different. However, the effects of the other variables, such as preferences on living arrangements may also differ for these two groups. The analysis in this study will be conducted so as to investigate these potential differences.

3.2.4 Marital Status

Geoffrey Carliner (1975) concludes from his study that marital status is a most important influencing factor on headship among unmarrieds. Shifts in age composition, location and race have not contributed as strongly to the rise in household headship for married persons as income. Although Chevan and Korson (1972) emphasize the influence that family history prior to widowhood plays in determining the opportunity structure for living arrangements during widowhood, they do not mention how the question of divorce could affect a parent/child relationship which would then have implications for living arrangements.

Frances E. Kobrin (1976A), using marital status as a focal point, develops three clear stages during adulthood: (1) pre-marital independence, (2) marriage, and (3) post-family independence. She, then, describes a new pattern of sex differentials which has emerged as a result of the interaction of the trend towards increased independence from

the family with the different marriage patterns of the two sexes. Kobrin explains that young males usually use the stage of premarital independence as an age in which to attain an increase in privacy and personal freedom; while female primary individuals are much older, many of them experiencing for the first time a separate individual household" (Kobrin, 1976A). Michael et al (1980) also, treat marital status as a classificatory variable. In this study, separate analyses will also be conducted by marital status.

3.2.5 Health Status

It is natural that the older a person gets his/her capacity to care for himself/herself could decrease due to some natural physical deterioration. Although the degree and rapidity of this deterioration cannot be controlled, it does have a tremendous influence on the living arrangements of the elderly.

The incapability of an elderly person to care for himself/herself may force the individual to live with others or to rely upon others to help meet the basic everyday needs. To be able to live alone, the elderly person must at least be able to function at a minimum level. With the advent of specialized nursing apartments, elderly persons whose capacity has diminished are capable of retaining some sort of independence while living in a cared-for situation. The main drawback to this is that the feasibility of this type of living arrangement is dependent upon one's ability

to afford it.

3.3 Summary

After reviewing the literature, there is strong evidence that there is a need for investigation into the living arrangements of the elderly in Canada. Two classifying factors which emerged as worthy of investigation with regard to living arrangements of the elderly are sex and marital status. Previous studies have also found that income, place of residence, religion, mother tongue, education, age and ethnic origin have an impact on living arrangements. The literature reveals that the effects of these variables on living arrangements might differ, depending upon one's marital status and sex.

CHAPTER IV

SPECIFICATION OF THE MODEL

On the basis of the previous studies cited and in keeping with the theoretical frameworks outlined, this study will analyze living arrangements of the elderly as a function of preferences, resources and prices, constrained in addition by life cycle stage. In this chapter, the variables that will be used as indicators of the concepts will be discussed.

4.1 Preferences

The acceptance of people of the trend of living alone provides the opportunity for an individual to exercise his/her preferences (Kobrin, 1976b) with regard to living arrangements.

Place of residence, urban or rural can affect one's views of living arrangements. Urban dwellers are more likely to live alone due to the availability of accommodations in the cities. Rural folk, on the other hand, due to the lack of facilities will have a greater tendency to live with others i.e. on a farm in a large house. It is usual for two and, often, three generations to co-reside on a farm. Place of residence therefore, can be used to measure preferences.

As Kyriazis and Stelcner (1984) point out ethnicity can also be used as a measure for preference. Ethnic background can affect the preferences which one has. Paralleling this reasoning, religion and mother tongue are variables which, although they are not categorized as preferences, per se, they can be seen as preconditions upon which preferences are based. These characteristics influence the choices which are made and will have an effect on whether one decides to live alone or not. Religion serves as an indicator of preferences with regard to living arrangements in the following manner. It is anticipated that Catholics will be more prone to live with family than are Protestants. That is due to the emphasis on family togetherness which the religion stresses.

Education is another variable which has an influence on preferences. As has already been mentioned, the higher the education, the higher the income. This results in a greater chance for an individual to living alone. If the elderly person is financially capable, then he/she has a choice. Thus, education can have an influence on the preferences one will have towards living alone.

4.2 Resources

Resources, according to much of the previous literature has proven to be the most important determinant of living arrangements (Carliner, 1975). Michael, Fuchs and Scott (1980) view the decision to live alone as a "reflection of

an economic demand for privacy and autonomy." Income will be the variable selected to measure this concept.

4.3 Price

Price, the third concept within the economic framework cannot be measured by individual characteristics but is determined by the availability and the supply of housing facilities. Today, with the increasing awareness of the need for single person housing, there is an increase in the facilities to accommodate these growing numbers. As indicated earlier, place of residence can be used as an indicator of prices, as well as preferences.

4.4 Classificatory Variables

Two factors which will also be considered as classificatory variables in the study are marital status and sex. These variables will classify the respondents into groups which can be compared.

1) Marital status is expected to influence living arrangements. As Geoffrey Carliner (1975) points out, "once adults move away from their parents home to set up their own households, they are likely not to return even though their family situations change". He further explains this by stating that "once people have married they are more likely to continue heading households if their marriages end than never married people are to do so without the stimulus of marriage." Thus, marital status

will be used as a classificatory variable in this study.

2) As already noted, due to their longer life expectancy, females will outnumber their male peers. The adjustment to single living for separated, divorced or widowed elderly is expected to be an easier one for females than for males. Females, because of their socialization to being homemakers, must learn to adjust only to living alone, while males have to adjust both to living alone as well as to the household chores. The variable sex will further be able to classify the respondents.

Although number of children ever born can be used in many instances as an indicator of the availability of kin, in this study, this variable poses a problem in that it is not reported for both men and women in the census. This will be discussed further in the methodology section.

The expected effects of the independent variables on living arrangements are summarized in Table 1.

TABLE 1.

EXPECTED EFFECT OF INDEPENDENT VARIABLES ON LIVING ARRANGEMENTS (HEADS=1)

Independent Variables	Expected Effect
Place Of Residence (Urban=1)	+
Age (Young old = 1)	-
Education	+
Religion (Catholic=1)	-
Ethnicity (British=1)	+
Mother Tongue (English=1)	+

CHAPTER V

METHODOLOGY

5.1 Data

The data source for this study is the 1981 Census of Canada Public Use Sample Tapes. The Individual File was used which consisted of a systematic 10% sample of all 1981 individuals enumerated. The entire Individual File has a sample of 486,875. A random subsample was selected. The size of the subsample at this stage was 5138 persons. For the purposes of this study, certain individuals were excluded, specifically, inmates or persons living in collectives, or in households outside of Canada, and temporary residents.

As the living arrangements of married persons are to be in joint households, married persons were omitted from the study. Because the elderly are the age group under investigation, all persons who were (single) aged 55 years and over were selected. This was the arbitrary age chosen by this researcher in lieu of 65 years, so that the age category could be divided into 3 categories for means of comparison. Soldo and Lauriat (1976) also use this figure in their study. The final sample size, thus, became 2824 persons.

A problem which Soldo and Lauriat (1976) note is the inconsistency of the description of living arrangements in

previous studies. In the past, living arrangements have been described by the size of the household or the quality of the relationship or the frequency of the contact. The use of the Census data remedies this situation because the Census data provide a more refined and concise classification. The household head can now be determined. The fact that the data are so recent enables this study to be a current and updated accounting of the situation of living arrangements. The main shortcoming of the use of these data is "the lack of an array of psychological and attitudinal variables that many gerontologists consider to be of paramount importance in their research effort to examine the welfare and quality of life for older persons." (Myers and Soldo, 1973).

Two methods of analysis will be used in this study are log linear and regression. These methods will be discussed in detail later in this chapter. We now proceed with a discussion of the measurement of the variables in the empirical model.

5.2 Measurement of Variables

Concepts are abstract. In order to operationalize the model, it was necessary to concretize the concepts. Following are the indicators chosen for the concepts.

5.2.1 The Dependent Variable: Living Arrangements

The formation of the variable for living arragements evolved in the following manner. The variable household type

categorizes family private households into either family types with or without additional persons as well as non-family types with or without additional persons. This was coupled with the household maintainer indicator to provide information as to whether the individual was a head or not - thus, producing the living arrangement variable consisting of five categories. For log-linear analysis, the living arrangement variable consisted of five categories:

1) non-heads$_1$ living with others who are in a family situation. This includes all family situations such as primary family, parents, secondary families or multiple families.

2) heads$_1$, living in non-primary family situations.

3) alone, is self-explanatory and refers to persons living with no other persons in a private household.

4) heads$_2$ in non-families which are greater or equal to two persons.

5) non-heads$_2$, of non-families which are greater or equal to two persons.

For regression analysis, living arrangements were recoded so that 1 = heads (including categories 2, 3 and 4) and 0 = non-heads (consisting of categories 1 and 5).

Classificatory Variables:

5.2.2. Sex

Sex refers to the gender of the respondent. The coding is 1 = female and 2 = male in log linear. For regression analysis, male was recoded to 0 to create a dummy variable.

5.2.3. Marital Status

Marital Status refers to the conjugal status of a person at the time of the census. For log linear analysis, 1= single and 3 = separated, divorced or widowed. Married persons were omitted. This coding was changed for regression analysis so that

1 = single
0 = separated, divorced, widowed

Preference Variables:

5.2.4. Place Of Residence

The variable Census Metropolitan Area (C.M.A.) is used as an indicator for place of residence., The main urbanized areas, having 100,000 persons or more population were coded (1), while rural residents were given the code (0). This coding was the same for both methods of analysis.

5.2.5. Age

Age refers to the age at last birthday as of the census reference date, June 3, 1981. It is coded as single years from 55 to 84, then 85 for any age of 85 years and over. For the log linear analysis, age was coded into 2 categories: (1) 55 years to 70 years, young-old and (2) 71 years to 85 years, old-old. For regression, the age variable was recoded to 3 dummy variables: youngold (55 years to 64 years), old (65 years to 74 years), and old-old (75 years and older). The reference category is old-old.

5.2.6. Highest Level of Schooling

The highest level of schooling attained was used as a measure of education. For log linear, the categories were

1 = high school education or equivalent and less.
2 = post high school
3 = university education

For regression, post high school education and university education, were recoded as dummy variables while category 1 was used as reference category.

5.2.7. Religion

Religion refers to a specific religious group or body with which one assumes an affiliation. This does not measure

activity or committment. The coding for log linear was:

1 = Catholics
2 = Protestants
3 = Others which include Jehovah's witnesses, Latter Day Saints, Reformed Bodies, Eastern Orthodox, Jewish, No religion or other.

For regression analysis, categories 1 and 2 entered the equation as dummy variables, while other was used as the reference category.

5.2.8. Ethnic Origin

Ethnic origin refers to the cultural group of the respondent or his/her ancestors upon first coming to this continent. For log linear it is coded so that:

1 = British
2 = French
3 = Other

For regression, categories 1 & 2 became dummy variables with category 3 as the reference category. It was found, however, that ethnic origin had an unacceptably high correlation with mother tongue, thus producing a problem of multicolinearity in regression analysis. When regressed separately, since mother tongue produced a higher R^2 than ethnic origin, the final regression runs include mother tongue but not ethnic origin as a determining variable.

5.2.9. Mother Tongue

Mother tongue refers to the first language which was learned in childhood and is still understood today. The

coding is as follows for log linear analysis:

1 = French
2 = English
3 = Other

For regression, French and English mother tongue were recoded into dummy variables tongue while "other" was used as the reference category.

Resources Variable:

5.2.9.a Total Income

The individual's total income includes the total 1981 income from wages and salaries, business or professional practice, farm operations, family and youth allowances, government old age pensions, other government payments, retirement pensions, other investment sources and other money income. The negative incomes were recoded to equal "0".

For the log-linear models, the income category was coded as follows:

(0) $0 - $ 9,999
(1) $10,000 - $19,999
(2) $20,000 - $29,999
(3) $30,000 and up

For regression analysis, incomes were recoded to 1,000 dollar intervals.

5.3 Methods of Data Analysis

5.3.1 Identification of Methods

The method of analysis commonly used for this type of study is multiple regression in which one variable is taken as the linear function of the values of several independent variables. Regression procedures, however, are normally used to predict numerical values on an interval or ratio dependent variable.

One important reason for using the general log-linear model rather than the least-squares (regression) model is because it makes no distinction between independent and dependent variables, but "is used to examine relationships among categoric variables analyzing expected cell frequencies" (Knoke and Burke, 1980). Soldo and Lauriat (1973) used this log-linear method to measure the living arrangements among the elderly in the United States.

According to Knoke and Burke, (1980) "an ordinary regression upon predictor variables can be interpreted as showing how the probability of a favorable response is affected." In one major version of log-linear models, a dichotomous dependent variable can be treated analogously to a regression, with the essential difference that the independent variables affect not the probability but the odds on the dependent variable (e.g. the ratio of favorable to unfavorable response). Thus, the dependent variable must be redefined. Instead of a proportion - where the cell

frequency is divided by the category total - we encounter the measurement of odds. Knoke and Burke (1980) explain odds as "the ratio between the frequency of being in one category and the frequency of not being in that category. Its interpretation is the chance that an individual selected at random will be observed to fall into the category of interest rather than into another category."

This study shall use the log-linear analysis to obtain an overview of the data. There is a problem, however, which must be recognized. Log-linear analysis necessitates the transformation of interval variables to ordinal variables. As a result, there is a loss of some information. Because of this drawback, ordinary multiple regression will also be used as a complementary method. In regression, however, when ordinal variables are converted into dummy variables, there is also loss of information. This study will include both methods of analysis so as to provide results which will complement each other. The log-linear method will be used for a more general overview of relationships between variables while the multiple regressions will be used for an examination of the effect of specific variables, especially interaction effects between marital status, sex and other explanatory variables.

5.3.2 Log-Linear

In log linear analysis, one is concerned with the fit of a model with the data. This is done by estimating the

expected cell frequencies for each proposed model using either the Pearson chi-square (x^2) or the likelihood ratio statistic (L^2). The larger the x^2 or L^2 relative to the available df, the more the expected frequencies depart from the actual cell entries. When a x^2 or L^2 is significant, it means that the model does not fit the data. This procedure differs from the traditional use of x^2 or L^2 where the originating point (or model) is the null hypothesis (or no relationship) only.

But, more than one model might fit the data. In such circumstances, one must be parsimonious. The simplest model is the point of departure. The researcher must see whether the difference between thismodel and a more complex one is statistically significant. If there is a significant difference then the more complex model must be accepted. This is so, because it means that the most complex one adds information which contributes to the explanation and cannot be ignored. Otherwise, the simpler model is retained.

A possible first model to propose is the one in which none of the independent variables has a significant relationship with the dependent variable (living arrangements). The model for testing this hypothesis has the general form of two fitted marginal tables, as follows:

(dependent variable) (independent variables) or in this specific example,

(living arrangements) (income, sex, marital status).

There are several steps which are followed to arrive at the best fitted model:

(1) The effect of the interaction term is calculated.

(2) The effect of the Independent Variable and the interaction term is then calculated.

(3) The fit of model (2) is tested against the alternative in which all of the independent variables are included.

(4) The fit of model (3) above is further tested against the effect of all the independent variables considered; alternative models which include progressively a larger number of independent variables in addition to the interaction term.

(5) The most parsimonious model which gives a satisfactory fit to the full crosstabulation is the model retained.

This procedure was followed with the original group of variables. Then, it was repeated with the addition of one more variable in the interaction term.

i.e. (dependent variable) (independent variables)

(living arrangements) (income, sex, marital status, education)

The steps were again followed allowing for the inclusion of the new independent variable. The effects were then noted, and the best fitting model was retained.

The variables which were included in the new more complex interaction term were: place of Residence, age, education, religion, ethnicity and mother tongue. Their effect was calculated and the model with the best fit selected. A discussion of the results is presented in the next chapter.

Another function of log-linear is to examine the effects attributable to specific variables. The (Ra^2) adjusted coefficients of multiple-partial determination can be used as a gross indicator of these effects. This coefficient is analogous to the coefficient of determination (R^2) in multiple regression analysis of quantitative variables and is similarly interpreted (Goodman, 1970). This figure is arrived at by subtracting the L^2 of the proposed model from L^2 of the original baseline model and dividing this by the L^2 of the original baseline model. The baseline model is selected whose L^2 will serve as a standard against which to judge the improvement in fit obtained by trying more complex alternative models. According to Knoke and Burke (1980), the baseline L^2 indicates the amount of variability in the data not due to factors already included in the matrix.

The Ra^2 analog is set forth as

$$\frac{(L^2 \text{ baseline model}) - (L^2 \text{ alternative model})}{(L^2 \text{ baseline model})}$$

The result of this analog when performed for different models indicates the variance explained by the addition of a new variable to the model.

Log-linear analysis is performed by the use of the

program ECTA. After a matrix of observed frequencies has been entered into the computer, this program produces the expected frequencies of a model by an iterative proportional fitting algorithm (Deming-Stephan Algorithm) used by Fay and Goodman. The iterative proportional fitting process "generates maximum likelihood estimates (MLE'S) of the expected cell frequencies for an hierarchical model" (Knoke and Burke, 1980).

Zeros in one or more cells can be problematic since odds, odds ratios and logits are undefined with zeros in the denominator. Observed zeros can arise either in finite samples when several variables are crosstabulated and due to small probabilities there are zeros in some cells or from a logical fixed zero cell when certain classifications in the design have no empirical referents. According to Knoke and Burke, (1980) "One virtue of log-linear models is that they can provide empirical estimates of the population frequencies despite the absence of empirical instances in the sample." Log-linear models are able to generate non-zero expected frequencies (Fij's) despite observed zero frequencies (Fij's). Knoke and Burke acknowledge that "too many" sampling zeros in the body of a table may create a problem where a marginal table to be fitted in the model contains zero cells". They set forth 2 basic alternatives to deal with this problem. The first is to add a small value to every cell in the body of the table, including those with non-zero frequencies. Goodman (1970) suggests the value of

(.5). Goodman (1970) describes a difference between the absolute zero and the structural zero. The second alternative is to arbitrarily define zero divided by zero to be (the structural) zero (Fienberg, 1977). Of course, a third but more unlikely solution presented would be to increase the sample size so as to eliminate any zero cells. According to Knoke and Burke, Goodman's procedure will tend to under-estimate effect parameters and their significance. As this drawback does not affect this study, Goodman's suggestion of adding .5 was used in this analysis.

5.3.3 Multiple Regression

Regression has become one of the most widely used statistical tools for multivariate analysis. Chatterjee and Price (1977) find regression appealing because "it provides a conceptually simple method for investigating functional relationships among variables." The standard approach in regression analysis, is "to use a sample of data to compute an estimate of the proposed relationship, and then evaluate the fit using statistics such as t, F and R^2." Regression analysis enables us to see how much of the dependent variable is explained by various independent variables. One of the assumptions of the method is that the variables are measured at the interval level. Nominal variables are recoded into dummy variables.

The use of the multiple regression method in this paper

is aimed at showing the specific effect of the independent variables on living arrangements. Four regressions using sex and marital status as classificatory variables were carried out. The four subsamples were:

(1) Single Females
(2) Single Males
(3) Separated, Divorced, or Widowed Females
(4) Separated, Divorced, or Widowed Males

The functional form of the equation is as follows:

Living Arrangements = f (income, place of residence, age, education, religion, ethnicity, mother tongue.)

The following chapter presents the results of the analyses based on the log linear and regression techniques.

CHAPTER VI

FINDINGS

6.1 Description of the Sample:

Table 2 presents the means and standard deviations for the variables included in the multiple regression model. These data were drawn from the Individual File of the 1981 Canadian Census.

Table 2 shows that 81.2% of females who are separated, divorced or widowed live as heads of households while 78.7% of their male counterparts are heads. These figures are comparable to the American data which show the separated, divorced or widowed females to be the largest segment of the population who are heads. For the single category, the males have a much higher percentage of heads (71.6%) than do the females (63.3%).

Urban living seems to be more prevalent for females than for males in both marital status categories. A mean percentage of 63.6% of single and 50.2% of the separated, divorced or widowed females compared to 38.7% of single males and 48% of separated, divorced and widowed males who are living in urbanized areas. Although city-living is becoming more popular, in general, it is particularly more so for females.

There are more than twice as many single males who are young-old (55 years - 64 years) compared to single

TABLE 2

Sample Means And Standard Deviations (In Brackets) For All Variables According To Sex And Marital Status

Variable	Single		Separated, Divorced, Widowed	
	Female	Male	Female	Male
Living Arrangement (1 = Heads)	.633 (.483)	.716 (.452)	.812 (.391)	.787 (.410)
Place of Residence (1 = Urban)	.636 (.482)	.387 (.488)	.502 (.500)	.489 (.500)
Young - Old (55yrs - 64yrs)	.033 (.179)	.068 (.252)	.025 (.157)	.049 (.216)
Old (65yrs - 74yrs)	.033 (.179)	.036 (.185)	.039 (.194)	.049 (.216)
Post High Educ.	.191 (.394)	.077 (.268)	.118 (.322)	.100 (.300)
University Educ.	.137 (.345)	.136 (.343)	.060 (.237)	.092 (.289)
Catholics	.522 (.500)	.490 (.501)	.397 (.489)	.387 (.488)
Protestants	.397 (.490)	.400 (.491)	.502 (.500)	.426 (.495)
English Mother Tongue	.534 (.500)	.545 (.499)	.571 (.495)	.564 (.496)
French Mother Tongue	.373 (.484)	.258 (.438)	.241 (.428)	.217 (.413)
Income	10.436 (8.023)	11.455 (12.440)	7.9345 (7.0950)	11.766 (11.854)
Number of Cases	335	310	1709	470

Note: With dummy variables the mean is interpreted as a proportion.

females (6.8% vs 3.3%). For older persons 65 years to 74 years, the distribution is almost the same 3.3% for single females compared to 3.6% for single males; separated, divorced or widowed males have the same percentage of 4.9% in both young-old and old categories. For females, there is an increase of 1.4% from the 55 - 64 year age group to the 65 - 74 year age group.

With respect to education, the table indicates that single women are the highest educated group with 19.1% attaining post high school education and 13.7% receiving a university education. Although education has been linked to separate living arrangements, it is worth noting that the highest educated group, the single females have the lowest percentage of persons living as heads (63.3%). This indicates that other variables must be interacting and influencing living arrangements.

Table 2 also shows that more single women are Catholic (52.2%) than Protestant while there are more separated, divorced or widowed (50.2%) women who are Protestant than Catholic. We obtain similar results for men. More single men are Catholic (49.0%) while 42.6% of the separated, divorced or widowed men are Protestant. These figures indicate that Catholics may remain single for longer but once they marry, they separate or divorce (or are widowed) less often than Protestants.

Twice as many single males are English speaking (54.5%) than French speaking (25.8%). This 2:1 ratio is seen for both of the sexes in the separated, divorced or widowed group. The group which does not adhere to this pattern is the Female/single group. The gap is closed here with 53.4% of the single women being anglophone compared to 37.3% of the single women being French speaking.

The mean income for the single females is $10,436, which is somewhat lower than the mean income of the single males ($11,455). There is a drastic difference noted when the mean income of $11,766 for the separated, divorced and widowed males is compared to the mean income of the females in that same category ($7,095). Men seem to be earning 1.5 times the amount of money women earn.

It should be noted here that the number of cases for single females, 335 cases, is very comparable to the number of cases for single males, 310 cases. In the marital status of separated, divorced and widowed there appears to be an imbalance; 1709 cases are females while only 470 cases are males. This is probably due to the survivorship factor - there is a much higher percentage of women in the higher age categories who would most likely be widowed.

The results of the log-linear analyses shall be discussed to provide an overview of the data. Then the multiple regression results will be examined to see the effect of each independent variable on the living arrangements of the elderly.

6.2 Interpretation Of Log-Linear Results

Table 3 shows seleeted log-linear models fitted in the present analysis, their associated goodness of fit, and their degrees of freedom. The terms in the models are specified by the marginals during the estimation procedure. Thus, for example, model H_5 hypothesizes that only marital status directly affects living arrangements, variable 4. This term is indicated by the notational convention of a "43" interaction. All of the models shown in Table 3 include a 3-way interaction term among the set of independent variables i.e. (123). This procedure, recommended by Slesinger and Travis (1975), results in isolating the effects of the independent variables on the dependent from the known association between the set of independent variables. Goodman's (1970) procedure of adding .5 to every cell in the body of the matrix was used to eliminate the zero cells.

6.2.1 Log-Linear-Basic Model

The basic model presented in Table 3 is represented by the interaction term [123] which means that all living arrangements are equiprobable. This interaction term represents the basic model which shall be held constant, and which includes all the independent variables in the equation.

TABLE 3

Goodness Of Fit Tests And Adjusted Coefficient Of Multiple-Partial Determination For Selected Log Linear Analyses*

	MODEL	NULL HYPOTHESIS	L^2	df	P	Ra^{2***}
H_1	[123]**	All living arrangements are equiprobable.	2718.15	64	.000	
H_2	[4][123]	All individuals have some odds for type of living arrangements.	487.40	60	.000	.821
H_3	[41][123]	Only income directly affects living arrangements.	376.49	48	.000	.861
H_4	[42][123]	Only sex directly affects living arrangements.	471.88	56	.000	.826
H_5	[43][123]	Only marital status directly affects living arrangements.	167.88	56	.000	.938
H_6	[41][42][123]	Income and sex affect living arrangements, but they are conditionally independent given type of living arrangement.	357.53	44	.000	.868
H_7	[41][43][123]	Income and marital status affect living arrangements, but they are conditionally independent given type of living arrangement.	60.16	44	.046	.978

H_8	[42][43][123]	Sex and marital status affect living arrangements, but they are conditionally, independent given type of living arrangement.	157.48	52	.000	.942
H_9	[41][42][43][123]	All of the independent variables affect type of living arrangements, but are conditionally independent of one another.	48.73	40	.236	.982

* Model Variables

1 = income ($0-$999, $10,000-$19,999, $20,000-$29,999, $30,000 and up)
2 = sex (female, male)
3 = marital status (single and separated, divorced, widowed)
4 = living arrangements
heads$_1$-living with others in family situations
non-heads$_1$-living with others in family situations other than with primary families.
alone
heads$_2$-Of non-families greater or equal to 2 persons
non-heads$_2$ of non-families greater or equal to 2 persons

**[123] signifies an interaction term which will be held constant in this table. Similarly, in the successive tables, we shall hold constant all the independent variables included in each equation. For rationale, see Chapter IV.

*** This Ra^2 is based on a comparison of the (L^2 in the baseline model-L^2 in the alternative)

$$\frac{}{L^2 \text{ baseline model}}$$

This statistic is analogous to the R^2 obtained in regression analysis.

Note: In log-linear analysis, a model is accepted when and only when there is no significant difference between the proposed model and the data, as explained in Chapter IV.

The L^2 from the basic model becomes the L^2 of the baseline model which is used to calculate the Ra^2.

i.e. $\frac{L^2 \text{ baseline model}^* - L^2 \text{ alternative model}}{L^2 \text{ baseline model}}$

These adjusted coefficients of multiple partial determination (Ra^2) shown in the last column (in Table 2) can be used as gross indicators. This coefficient is analogous to a multiple correlation coefficient in multiple regression analysis of quantitative variables and is similarly interpreted (Goodman, 1970,1972B). All of the adjusted coefficients which are shown in Table 3 were derived by evaluating model H_1. This was previously discussed in Section 5.3.2. Therefore, each coefficient can be interpreted as the decrease in unexplained variance which results from the inclusion of the terms of the model in question which differ from the (123) of the baseline model.

Models H_3- H_5 show the gross effects of each of the independent variables on living arrangements. Of these models, the hypothesis that only marital status (model H_5) directly affects living arrangements is most successful (Ra^2 =.938) in accounting for the variance left unexplained by the base model H_1 . This conclusion persists when we examine models H_6 - H_8 . When income and marital status, conditionally independent given type of living arrangement, are examined we note that

* The baseline model could also be called the basic model.

the Ra^2 is increased to .978. The highest effect of unexplained variance can be seen in H_9. Not only does this model have the greatest effect but it is also the only model which is not significant. The odds of having the matrix repeated in the population again is 23.6% of the time. Thus, the model with the best fit is H_9 where:

[41] [42] [43] [123] = all of the independent variables affect type of living arrangements but are conditionally independent of one another.

where
[41] [living arrangements; income]
[42] [living arrangements, sex]
[43] [living arrangements, marital status]
[123] [interaction between income, sex, marital status]

6.2.2 Log-Linear With Place Of Residence Included In Basic Model

When place of residence was added to the equation, it became a part of the constant interaction term.

Let 5 = place of residence
i.e. [1235] [income, sex, marital status, place of residence]

TABLE 4

Goodness Of Fit Tests And Adjusted Coefficient Of Multiple-Partial Determination For Selected Log-Linear Analyses With Place Of Residence Included*

	MODEL	L^2	df	P	Ra^2
H_1	[1235]	2746.98	128	.000	-
H_2	[4][1235]	555.93	124	.000	.798
H_3	[41][1235]	442.85	112	.000	.839
H_4	[42][1235]	541.51	120	.000	.803
H_5	[43][1235]	246.50	120	.000	.910
H_6	[45][1235]	543.42	120	.000	.802
H_7	[41][42][1235]	425.25	108	.000	.845
H_8	[41][43][1235]	135.32	108	.032	.951
H_9	[41][45][1235]	427.59	108	.000	.844
H_{10}	[42][43][1235]	239.56	116	.000	.913
H_{11}	[42][45][1235]	528.55	116	.000	.808
H_{12}	[43][45][1235]	236.10	116	.000	.914
H_{13}	[41][42][43][1235]	128.13	104	.099	.953
H_{14}	[41][42][45][1235]	409.06	104	.000	.851
H_{15}	[41][43][45][1235]	124.22	104	.088	.955
H_{16}	[42][43][45][1235]	228.22	112	.000	.917
H_{17}	[41][42][43][45][1235]	115.90	100	.235	.958

* Model

1 = income
2 = sex
3 = marital status
4 = living arrangements
5 = place of residence

Table 4 indicates that of all the models which are tested only the following three were not significant:

		L^2	df	P	Ra^2
(1) H_{13}	[41] [42] [43] [1235]	128.13	104	.099	.953

Only income, sex, marital status affect type of living arrangement but are conditionally independent of one another.

		L^2	df	P	Ra^2
(2) H_{15}	[41] [43] [45] [1235]	124.22	104	.088	.954

Only income, marital status and place of residence affect type of living arrangement but are conditionally independent of one another.

		L^2	df	P	Ra^2
(3) H_{17}	[41] [42] [43] [45] [1235]	115.90	100	.235	.958

All of the independent variables affect type of living arrangements, but are conditionally independent of one another.

When H_{13} was compared with H_{15}, there was no statistically significant difference. Because H_{13} has a higher P value it was the model which was tested against H_{17}. The difference between these two models was calculated as follows:

	L^2	df
H_{13}	128.13	104
- H_{17}	115.90	100
	12.23	4

A chi-square table was then referred to, to determine whether the difference was significant. It was found to be significant and so model H_{17} was retained as the better model. The decrease in unexplained variance which results from the inclusion of the variables differs significantly from the term in the baseline model.

6.2.3 Log-Linear With Age Included In Basic Model

The only model which was found not to be significant, that is, fitted the data, was the one which contained all of the independent variables.

	L^2	df	P
[41] [42] [43] [45] [1235]	117.91	100	.098

The complete table can be found in Appendix A - Table A-1. Income, sex, marital status and age affect type of living arrangements, but are conditionally independent of one another.

6.2.4 Log-Linear With Education Included In Basic Model

The result observed when education was introduced into the equation proved to be a very interesting one. The basic

interaction

[123] where 1=income, 2=sex, 3=marital status term of was modified to read [1235] where all other variables were the same and 5=Education. Education was coded in 3 categories for log-linear.

Of the models set forth, 4 models were found not to be significant. They are shown in table 5.

TABLE 5

Log Linear Models With Education Included In The Basic Model - Models To Determine Best Fit*

		L^2	df	P	Ra^2
H_8	[41] [43] [1235]	170.32	171	.5	.938
H_{13}	[41] [42] [43] [1235]	161.95	168	.5	.941
H_{15}	[41] [43] [45] [1235]	161.07	164	.5	.941
H_{17}	[41] [42] [43] [45] [1235]	151.47	160	.5	.945

*The complete Table is presented in Appendix A - Table A-2.

To determine the best fit, H_8 was compared with H_{13}, H_{15} and H_{17}. The more complex models were thus, rejected in favour of the simpler H_8 model. It can, therfore, be deduced from the above results, that when education was included in the original basic model of income, sex andmarital status as determinant of living arrangements, it was found to neutralize the effect of sex. With regard to living arrangements, sex and education are

so closely related that they are interchangeable.

It can be noted that the R^2_a is exactly the same for H_{13} and H_{15} and further support the proposal that these two variables are interchangeable. Even though a slightly higher amount of the variance is explained by the inclusion of all the variables ($H_{17} - H_8$) or (.945 - .938 = .007), the difference between the two is not significant. Thus, the model with the best fit remains H_8.

To summarize, when education is introduced into the basic interaction the best model is the one which hypothesizes that income and marital status affect type of living arrangement, but they are conditionally independent given type of living arrangement.

6.2.5 Log-Linear With Religion Included In The Basic Model

When religion was introduced into the basic model interaction term, (let 5=Religion) only three models were not significant. The results are shown in Table 6.

TABLE 6

Log-Linear Models With Religion Included In The Basic Model - Models To Determine Best Fit*

		L^2	df	P	Ra^2
H_{13}	[41] [42] [43] [1235]	201.26	168	.110	.928
H_{15}	[41] [43] [45] [1235]	156.86	164	.5	.944
H_{17}	[41] [42] [43] [45] [1235]	150.24	160	.5	.946

* The complete table is presented in Appendix A - Table A-3.

H_{13} is the original full basic model with the addition of religion in the interaction. When H_{13} and H_{15} are compared, it was discovered that the difference was not significant. Because the P value was higher, the model which included religion H_{15} was retained rather than the one with sex. When H_{15} and H_{17} were compared, the chi-square significance level was not significant. Thus H_{15} which states that income, marital status and religion affect type of living arrangements but that they are conditionally independent given type of living arrangement, is the model with the best fit to the crosstabulation data.

6.2.6 Log-Linear With Ethnic Origin Included In The Basic Model

Only two models fit the data when Ethnic Orgin was

included in the basic model: These two models are shown in Table 7.

TABLE 7

Log-Linear Models With Ethnic Origin Included In The Basic Model - Models To Determine Best Fit*

	L^2	df	P	Ra^2
H_{15} [41] [43] [45] [1235]**	183.77	164	.242	.935
H_{17} [41] [42] [43] [45] [1235]	175.80	160	.380	.937

* The complete table is presented in Appendix A - Table A-4.
** In this model 5 = ethnic origin.

In H_{15}, the effect of sex as an independent factor affecting type of living arrangement is eradicated. The effect of ethnic origin was of sufficient strength to replace it. When H_{15} and H_{17} were compared, the difference of 7.97 with 4 degrees of freedom was not significant. Therefore, the model with the best fit is H_{15}. This model hypothesizes that income, marital status and ethnic origin affect type of living arrangement but are conditionally independent of one another. Sex is included only as having an interaction effect not an independent effect on living arrangements.

6.2.7 Log-Linear With Mother Tongue Included in The Basic Model

The final models to be tested for goodness-of-fit were

those which introduced the mother tongue variable. This variable representing language first learned and still spoken or understood became #5 in the interaction term and was coded (1) English, (2) French and (3) Other.

Three significant models resulted as shown in Table 8.

TABLE 8

Log-Linear Models With Mother Tongue Included In The Basic Model - Models To Determine Best Fit*

		L^2	df	P	Ra^2
H_{13}	[41] [42] [43] [1235]	215.20	168	.057	.923
H_{15}	[41] [43] [45] [1235]	167.13	164	.5	.940
H_{17}	[41] [42] [43] [45] [1235]	158.82	160	.5	.943

* The complete table is presented in Appendix A - Table A-5.
** In this Table 5 = mother tongue

When H_{13} and H_{15} were compared the 48.07 difference with 4 degrees of freedom was found not to be significant.

The model including mother tongue (H_{15}) in lieu of sex was retained because the level of significance(P) was greater. This model H_{15} was then compared to H_{17} and the difference of 8.51 with 4 degrees of freedom was found not to be significant. Therefore, for parsimony, the model with the best fit is the one [H_{15}] which includes income, marital status and mother tongue as affecting type of living arrangement, but they are conditionally independent given type of living arrangement.

TABLE 9

Summary Of All The Retained Log-Linear Models

		L^2	df	P	Ra^2
Basic Model	[41] [42] [43] [123]	48.73	40	.236	.982
With					
Place of Residence	[41] [42] [43] [45] [1235]	115.90	100	.235	.958
Age	[41] [42] [43] [45] [1235]	117.91	100	.098	.958
Education	[41] [43] [1235]	170.32	172	.5	.938
Religion	[41] [43] [45] [1235]	156.86	164	.5	.944
Ethnic Origin	[41] [43] [45] [1235]	183.77	164	.242	.935
Mother Tongue	[41] [43] [45] [1235]	167.13	164	.5	.940

1 = income
2 = sex
3 = marital status
5 = changes, dependent upon new variable introduced

6.3 Multiple Regression:

The analyses were conducted separately on four subsamples selected on the basis of sex and marital status. The subsamples are:

1) Female/never married
2) Male/never married
3) Female/separated, divorced, widowed
4) Male/separated, divorced, widowed

6.3.1 Results - Marital Status: Single

The results of the regression analyses are presented in Tables 10 and 11. Table 10 indicates that for single females, income has the strongest impact on living arrangements (beta = .115) with education ranking second (beta = .112) and French mother tongue as third (beta = .111).

With respect to age, the results show that 13.4% more young-old (55 years to 64 years) single females are likely to be heads than old (65 years to 74 years) single females. Since health status is correlated with age, this relationship may reflect the influence of health on living arrangements.

As expected, Catholics are less likely to be heads than either Protestants or others. It is important to note, however, that although the direction of the effects is consistent with the hypotheses of this study, there were no statistically significant results in this regression.

Table 10

Regression Of Living Arrangements On All Independent Variables (Standard Errors Are In Brackets)

Marital Status:Single

Independent Variables	Females		Males	
	Unstandardized Coeff.	Standardized Coeff.	Unstandardized Coeff.	Standardized Coeff.
Place of Residence (1 = Urban)	.043 (.055)	.042	- .008 (.055)	- .008
Young-Old (55-64years)	.175 (.149)	.065	.114 (.103)	.063
Old (65-74years)	.041 (.147)	.015	.126 (.142)	.052
Post High Education	.137 (.075)	.112	.135 (.101)	.080
University Educ.	.090 (.089)	.065	.110 (.081)	.083
Catholic	- .085 (.112)	- .088	- .150 (.093)	- .167
Protestant	.014 (.103)	.014	- .041 (.091)	- .045
English Mother Tongue	.018 (.098)	.019	- .026 (.075)	- .029
French Mother Tongue	.110 (.104)	.111	.020 (.082)	.019
Income	.007 (.004)	.115	.002 (.002)	.067
N	335		310	
Constant	.475		.753	
R^2	.053		.040	

* P = .05 level of significance
** P = .01 level of significance
*** P = .001 level of significance

In the single men category, Catholics are 10.9% less likely than Protestants to be heads of households. Among single men who reside in the city, .8% are less likely to be heads of households than those who live in rural areas 2.6% of those single men who have English as their mother tongue are less likely to live as heads than those whose mother tongue is French.

When comparing the R^2 for the marital status of singles, it can be seen that 5.3% of the variance of the dependent variable is explained by the independent variables for the female single category while only 4.0% is explained in the single male category. The model does not fit the data very well for single males and females as is evidenced by the low R^2's. The lack of any statistically significant effects in these categories of the independent variables further support this conclusion that these variables do not explain living arrangements for single men and women.

6.6 Results - Marital Status: Separated, Divorced, or Widowed

Table 11 presents the results of the regression analyses for separated, widowed and divorced males and females. It can be noted that for females in the separated, divorced or widowed category the results are for the most part statistically significant. The variable which has the most impact on living arrangements is income (beta =.126), with the next

most influential variable being English mother tongue (beta =.123), and the third most important variable being French mother tongue (beta = .118). All of these variables are significant.

It was found that there is a 5.7% greater likelihood for separated, divorced or widowed females with a post high school education to be heads than those with less than a high school education. There is a 13.5% greater likelihood of females, who are separated, divorced or widowed between 55 years to 64 years to be heads of households than those over 75 years of age. Both of these variables were statically significant.

The place of residence variable produced a significant effect. As Table 11 shows, there is 4.9% likelihood that separated, divorced or widowed females who live in the urban areas will not be heads of households.

Of the three statistically significant independent variables, two are the dummy variables created for mother tongue. There is a 1.0% greater likelihood of females separated, divorced or widowed who have French as their mother tongue to be heads than those with English as their mother tongue.

Table 11

Regression Of Living Arrangements On All Independent Variables (Standard Errors Are In Brackets)

Marital Status: Separated, Divorced, Widowed

Independent Variable	Female		Males	
	Unstandardized Coeff.	Standardized Coeff.	Unstandardized Coeff.	Standardized Coeff.
Place of Residence (1 = Urban)	-.049** (.019)	-.063	-.003 (.038)	-.004
Young-Old (55-64years)	.135* (.041)	.054	.089 (.086)	.047
Old (65-74years)	.018 (.048)	.009	.219** (.085)	.115
Post High Educ.	.057* (.030)	.047	.126* (.062)	.092
University Educ.	.054 (.041)	.035	.009 (.067)	.006
Catholic	.024 (.037)	.030	-.105 (.058)	-.126
Protestant	.047 (.034)	.060	-.040 (.052)	-.048
English Mother Tongue	.098*** (.027)	.123	.051 (.049)	.062
French Mother Tongue	.108*** (.033)	.118	.029 (.062)	.030
Income	.007*** (.001)	.126	.008*** (.002)	.223
N	1709		470	
Constant	.652		.692	
R^2	.048		.097	

* P = .05 level of significance
** P = .01 level of significance
*** P = .001 level of significance

It is also shown in Table 11 that for every $700 increase in income there is a .007 greater likelihood that females who are separated, divorced or widowed will live as heads of households. This is the most important result as this supports the theoretical specification set forth that income is expected to affect living arrangements positively.

When we examine the male subsample in Table 11 we can see that unquestionably income has the greatest impact on living arrangements (beta = .223), with Catholics ranking second (beta = .126) and old (65 years to 74 years) ranking third (beta = .115). Of these three, two are statistically significant, old and income.

With respect to education, males who are separated, divorced or widowed with a post high school education have a greater (12.6%) likelihood of living as heads of households than those with less than high school education. This is significant at the .05 level of significance.

Age (old, between 65 years and 74 years) for males who are separated, divorced or widowed produces a statistic which is significant at the .01 level of significance when regressed upon living arrangements. Males, of this group

are 21.9% more likely to live alone than males in the 75 and over group and 13% more likely to live alone than males in the young-old group, between 55 years and 64 years of age.These results indicate that there is a curvilinear relationship between age and living arrangements.

As expected, variables such as age, education, religion and ethnic origin and mother tongue do have an effect on living arrangements. These effects vary in direction and degree, as has already been discussed. Ethnic origin and mother tongue were found to be so highly correlated that one had to be omitted. Two regessions were done: one with all the independent variables excluding ethnic origin and one whith all the independent variables excluding mother tongue. Because the R^2 for the regression omitting ethnic origin was higher than that omitting mother tongue, mother tongue was retained in the equation.

The expected result of differences in statistical significance, dependent on the group, was proven. This was perhaps, a result of the imbalance in numbers of the groups. The samples were, perhaps, too small to produce significant results in the single categories. With the increase in numbers in the separated, divorced and widowed categories, there is also an increase in significance.

The most highly significant effect is

that of income. Table 11 shows that with increasing income, separated, divorced or widowed males are more likely to live as heads. This again, supports the specification set forth.

When the R^2's are compared for the different marital status groups, it is interesting to note that for female singles, these independent variables explain 5.3%, of the variance while for the separated, divorced and widowed female group the R^2 decreases to 4.8%. For single males, these variables explain only 4.0% of the variance but 9.7% for the separated, divorced or widowed male group.

CHAPTER VII

SUMMARY AND CONCLUSIONS

7.1 Summary Log Linear:

The log linear analysis provided an overview of the variables. The interaction term in the basic model was income, sex and marital status. The effect of each independent variable on living arrangements when included with the interaction term containing these three independent variables proved to be the most parsimonious model as well as the model which explained the most variance. (Ra^2 = .982 See Table 9). Even when other variables were included into the basic model, there was no more explained variance. Therefore, although variables such as place of residence, age, education, religion, ethnic origin and mother tongue do have an effect on living arrangements, the log-linear results indicate that they are secondary effects. As expected, income, and marital status are most important. Sex was expected to have more of an effect but its effect was found to be lessened with the inclusion of other variables.

7.2 Summary: Regression:

The results obtained do support the specified hypotheses. Income was found to have the strongest effect on living arrangements. The effect was positive

indicating that an increase in income increases the likelihood of individuals to live as heads of households.

Although sex was found to affect living arrangements, the effect, as anticipated, was not as strong nor as consistent as that of income. As was already indicated, more separated, divorced or widowed women live as heads of households while, in the single category, more men live as heads.

Marital status did prove to affect living arrangements, thus, supporting the use of the family life cycle approach which recognizes that a change in family cycle stage may have an impact on the living arrangements of the elderly.

The results also indicate that females who are separated, divorced or widowed are more likely to live as heads compared to males. This may be due to the fact that there may be more women numerically than men. Even if the numbers were the same, women would, perhaps, find it easier to adjust to separate living due to the fact that they are socialized to keep house and a major adjustment would be to the separation, divorce or the loss of the spouse. Along with these adjustments, the males in this group would be forced to tend house which would be a second major adjustment. This may account for the difference in heads in these categories.

It was originally anticipated that the availability of

kin would be explored as an option of the living arrangements of the elderly. When this was looked at more closely, it was found that the census data were lacking in information. Availability of kin can be represented by number of children ever born but the data provide information on the number of children born to females but do not indicate whether or not men have offspring. Because of this lack of comparable information for men and women regarding availability of kin, the variable was not included in the analyses.

7.3 Conclusions

This study has been an investigation of the living arrangements of the elderly in Canada. The theoretical approach enhances the economic theory by coupling it with the family life cycle approach to produce a model which is worthy of investigation. The specification of the model was tested by using two methods of analysis and the data used was the Individual file of the 1981 Census of Canada Public Use Sample Tapes.

The log-linear method was used to provide an overview of the data and to establish a general basic model. This general model was elaborated upon by the inclusion of other variables separately into the basic model to establish the effects of these independent variables. The log-linear method provided the information needed to obtain

an overview of the effects of the independent variables. A regression analysis was subsequently carried out to determine the specific effect of the independent variables on living arrangements for the four categories of sex and marital status. The results varied considerably for the four subsamples and suggest that perhaps the imbalance of women was a factor.

In general, these findings provide a point of departure for individuals involved in research on the living arrangements of the elderly. They suggest the need for further investigation of the living arrangements of the elderly using a combination of the economic and the family life cycle approach.

The regression models designed to examine the problem show the need for a revision of the models to include not only the selected "quantitative" variables which the census data provide but also to consider the "psychological and attitudinal" factors. Personal preferences involving privacy and independence, as well as health factors and domestic competency are normative factors which should be considered because of their influence on the 'needs' of the elderly. Due to their subjective nature, interviews would provide the most effective method of data collection. More research is required and improved models are needed to investigate more successfully the area of living arrangements. Perhaps, in further research a model with the inclusion of these subjective influences upon living

arrangements might be examined.

The model might be modified by including kin relationships. The financial situation of available relatives or the health status of the available relatives may be influencing factors on the living arrangements of the elderly. The preferences of the elderly might be considered, perhaps, more closely. In instances where income is not an issue, the question of choice should be explored more fully. Since the findings of this study suggest that different variables might be relevant as determinants of living arrangements for singles and ever-married, these possible differences should be explored in future research.

The implications of this research are far-reaching. Firstly, the youth of today must be awakened to the numbers and the needs of the elderly. Secondly, the middle-aged community must be properly prepared and socialized for their future role. These can be done in the future, through education. By educating our society, we can provide a better understanding of the situation. Because income is found to be the key determinant of living arrangements, at least for the ever-married, there is a strong need for immediate government assistance and social policies. Aid to the elderly can be issued either financially through increased old age pensions or by providing sufficient and affordable low cost housing.

With the decline in school-aged children and the rising numbers of elderly this can, perhaps, be accomplished by converting unneeded schools to low cost individual apartments, where elderly can reside while retaining their independence.

As has been noted in this paper at the outset, the elderly have just emerged as a population which must be recognized. Their concerns have recently begun to be more intensely acknowledged and investigated by researchers. It is hoped that this study shall make some contribution to this growing body of knowledge.

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APPENDIX A

TABLE A-1

Goodness Of Fit Tests And Adjusted Coefficient Of Multiple-Partial Determination For Selected Log-Linear Analyses* With Age Included

MODEL	L^2	df	P	Ra^2
H_1 [1235]	2810.12	128	.000	-
H_2 [4][1235]	644.03	124	.000	.771
H_3 [41][1235]	531.83	112	.000	.811
H_4 [42][1235]	623.36	120	.000	.778
H_5 [43][1235]	307.12	120	.000	.891
H_6 [45][1235]	547.83	120	.000	.805
H_7 [41][42][1235]	510.01	108	.000	.819
H_8 [41][43][1235]	202.10	108	.000	.928
H_9 [41][45][1235]	451.68	108	.000	.839
H_{10} [42][43][1235]	294.97	116	.000	.895
H_{11} [42][45][1235]	524.11	116	.000	.813
H_{12} [43][45][1235]	221.65	116	.000	.921
H_{13} [41][42][43][1235]	190.31	104	.000	.932
H_{14} [41][42][45][1235]	427.72	104	.000	.848
H_{15} [41][43][45][1235]	130.03	104	.000	.954
H_{16} [42][43][45][1235]	209.35	112	.000	.926
H_{17} [41][42][43][45][1235]	117.91	100	.098**	.958

* Model:

1 = income
2 = sex
3 = marital status
4 = living arrangements
5 = age

** P = < .05 level of significance

TABLE A-2

Goodness Of Fit Tests And Adjusted Coefficient Of Multiple-Partial Determination For Selected Log-linear Analyses* With Education Included

MODEL	L^2	df	P	Ra^2
H_1 [1235]	2748.49	192	.000	-
H_2 [4][1235]	588.00	188	.000	.786
H_3 [41][1235]	486.16	176	.000	.823
H_4 [42][1235]	573.89	184	.000	.791
H_5 [43][1235]	266.97	184	.000	.903
H_6 [45][1235]	558.90	180	.000	.797
H_7 [41][42][1235]	469.24	172	.000	.829
H_8 [41][43][1235]	170.32	172	.5**	.938
H_9 [41][45][1235]	467.98	168	.000	.830
H_{10} [42][43][1235]	259.29	180	.000	.906
H_{11} [42][45][1235]	543.41	176	.000	.802
H_{12} [43][45][1235	250.30	176	.001	.909
H_{13} [41][42][43][1235]	161.95	168	.5**	.941
H_{14} [41][42][45][1235]	449.36	164	.000	.837
H_{15} [41][43][45][1235]	161.07	164	.5**	.941
H_{16} [42][43][45][1235]	240.89	172	.002	.912
H_{17} [41][42][43][45][1235]	151.47	160	.5**	.945

* Model

1 = income
2 = sex
3 = marital status
4 = living arrangements
5 = education

** P = < .05 level of significance

TABLE A-3

Goodness Of Fit Test And Adjusted Coefficient Of Multiple-partial Determination For Selected Log-Linear Analyses* With Religion Included

MODEL	L^2	df	P	Ra^2
H_1 [41][1235]	2796.25	192	.000	-
H_2 [41][1235]	618.54	188	.000	.779
H_3 [41][1235]	522.17	176	.000	.813
H_4 [42][1235]	603.23	184	.000	.784
H_5 [43][1235]	302.03	184	.000	.892
H_6 [45][1235]	543.36	180	.000	.806
H_7 [41][42][1235]	503.80	172	.000	.820
H_8 [41][43][1235]	208.25	172	.048	.926
H_9 [41][45][1235]	451.82	168	.000	.838
H_{10}[42][43][1235]	294.28	180	.000	.895
H_{11}[42][45][1235]	530.74	176	.000	.810
H_{12}[43][45][1235]	247.83	176	.001	.911
H_{13}[41][42][43][1235]	201.26	168	.110	.928
H_{14}[41][43][45][1235]	436.07	164	.000	.844
H_{15}[41][43][45][1235]	156.86	164	.5**	.944
H_{16}[42][43][45][1235]	240.47	172	.001	.914
H_{17}[41][42][43][45][1235]	150.24	160	.5**	.946

* Model

1 = income
2 = sex
3 = marital status
4 = living arrangements
5 = religion

** P = < .05 level of significance

TABLE A-4

Goodness of Fit Test and Adjusted Coefficient of Multiple-Partial Determination for Selected Log-Linear Analyses With Ethnic Origin Included

MODEL	L^2	df	P	Ra^2
H_1 [1235]	2808.63	192	.000	-
H_2 [4][1235]	654.19	188	.000	.767
H_3 [41][1235]	545.24	176	.000	.806
H_4 [42][1235]	637.26	184	.000	.773
H_5 [43][1235]	330.37	184	.000	.887
H_6 [45][1235]	595.60	180	.000	.788
H_7 [41][42][1235]	526.19	172	.000	.813
H_8 [41][43][1235]	226.26	172	.012	.919
H_9 [41][45][1235]	502.55	168	.000	.821
H_{10} [42][43][1235]	323.47	180	.000	.885
H_{11} [42][45][1235]	580.91	176	.000	.793
H_{12} [43][45][1235]	278.05	176	.000	.901
H_{13} [41][42][43][1235]	219.33	168	.032	.922
H_{14} [41][42][45][1235]	485.21	164	.000	.822
H_{15} [41][43][45][1235]	183.77	164	.242**	.935
H_{16} [42][43][45][1235]	270.09	172	.000	.904
H_{17} [41][42][43][45][1235]	175.80	160	.380**	.937

* Model

1 = income
2 = sex
3 = marital status
4 = living arrangements
5 = ethnic origin

** P = < .05 level of significance

TABLE A-5

Goodness Of Fit Test And Adjusted Coefficient Of Multiple-Partial Determination For Selected Log-Linear Analyses* With Mother Tongue Included

MODEL	L^2	df	P	Ra^2
H_1 [1235]	2805.03	192	.000	-
H_2 [4][1235]	644.62	188	.000	.770
H_3 [41][1235]	533.38	176	.000	.810
H_4 [42][1235]	629.85	184	.000	.775
H_5 [43][1235]	332.02	184	.000	.882
H_6 [45][1235]	556.75	180	.000	.802
H_7 [41][42][1235]	516.16	172	.000	.816
H_8 [41][43][1235]	222.36	172	.023	.921
H_9 [41][45][1235]	466.72	168	.000	.834
H_{10}[42][43][1235]	325.33	180	.000	.884
H_{11}[42][45][1235]	543.75	176	.000	.806
H_{12}[43][45][1235]	263.71	176	.001	.906
H_{13}[41][42][43][1235]	215.20	168	.057**	.923
H_{14}[41][42][45][1235]	450.62	164	.000	.839
H_{15}[41][43][45][1235]	167.13	164	.5**	.940
H_{16}[42][43][45][1235]	256.09	172	.001	.909
H_{17}[41][42][43][45][1235]	158.82	160	.5**	.943

* Model

1 = income
2 = sex
3 = marital status
4 = living arrangements
5 = mother tongue

** P = < .05 level of significance