WORKING PAPER

KIN AVAILABILITY AND THE LIVING ARRANGEMENTS OF OLDER UNMARRIED WOMEN: CANADA, 1985

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Foreword

Because women live longer than men the older population consists predominantly of women; because women are usually younger than their spouses, widows predominate even more strongly over widowers. That living alone has come with increasing income suggests that privacy has been an important value all along, and only now can it be afforded. Living with children is the main alternative to living alone and it could be expected to diminish as fertility falls. The more activities that are difficult or impossible for the person, the less chance that she lives alone. Such broad statements are about as far as one can go on the basis of general information.

The present paper goes much further. It uses data on a sample of Canadian women to examine the effects of 11 variables on living alone. Having children contributes to living with children, of course, but having grandchildren cancels out this effect, and contributes to living alone. (Whether this is by the wish of the person, the child or the grandchild, we do not know.)

Again, the more educated the person, the less likely she is to live with children. Perhaps education in itself directly forms the need for privacy. But we also know that the more educated have fewer children, so it is also possible that it is this effect of education that is an intervening variable in the positive relation of education and living alone. However the authors were able to hold fertility constant, and the same positive relation appeared.

This investigation was made possible by the collaboration of scholars from Canada and the United States, the provision of data by Statistics Canada, and financial help from several sources.

Nathan Keyfitz
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Abstract

A model of the living arrangements of older unmarried women is presented, using data from a 1985 survey of the Canadian population. Living arrangements are represented by a multichotomous variable distinguishing those living alone, with children, with siblings, and with others. The hypothesized determinants of living arrangements include income, disability status, the array of available kin, and education. Results from a multinomial logit estimation of the model confirm the importance of income, disability and kin availability; particularly interesting is the significant effect of the number of grandchildren on the relative propensities to live alone, with children, and with siblings.

Acknowledgements

This research was supported in part by a grant from the Alfred P. Sloan Foundation to IIASA, and by a contract from the Review of Demography, Health and Welfare Canada to the Population Studies Centre, University of Western Ontario. This analysis is based upon Statistics Canada microdata tape, Health and Social Support, which contains data collected in the 1985 General Social Survey. All computations on these microdata were prepared at IIASA and the responsibility for the use and interpretation of these data is entirely that of the authors.

Contents

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Douglas A. Wolf, Thomas K. Burch, Beverly J. Matthews**

Introduction

The populations of most industrialized nations have in recent years become increasingly elderly in composition. This aging process has been accompanied by a growing awareness of the scholarly and policy issues associated with the well-being of the elderly. Well-being is of course a very broad concept; one of its numerous dimensions is that of living arrangements. Living arrangements are closely related to the status of the elderly, since the presence or absence of others in the household is a key index of an older person's ease of access to personal care and social interaction.

When considering the circumstances of the elderly, a fundamental distinction can be made between those with and those without a spouse or partner. Those with a spouse are in most cases observed to live with the spouse (and, possibly, with others as well) while those without a spouse are at risk of living alone. Moreover, among the spouseless elderly, women predominate, due both to the general tendency of married women to be somewhat younger than their husband, and to the widespread pattern of differential life expectancies, with women living longer than men on average. For these reasons it is useful to focus analysis of living arrangements on the population of older unmarried women.

Existing research on the living arrangements of older women includes time-series analyses based upon aggregate data, and cross-sectional studies based on individual data. The time-series analyses have documented a clear postwar trend toward smaller households, and an accompanying tendency for elders to live alone, in the United States (Kobrin, 1976a; 1976b) Canada (Harrison, 1977; Wargon, 1979; Burke, 1986) and Europe (Wall, 1984; Wolf, 1987). Researchers have explained this trend in terms of changed fertility patterns and rising income levels, among other factors (Michael, Fuchs and Scott, 1980; Wister and Burch, 1983; Pampel, 1983).

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Cross-sectional studies of household composition have also examined the role of family patterns, health, income and other possible influences on living arrangements (see, for example, Chevan and Korson, 1972; Soldo and Lauriat, 1976; Tissue and McCoy, 1981; and Soldo, Sharma, and Campbell, 1984). Income and health (or disability) status are readily interpretable as indicators of constraints upon the set of potential living arrangements.

An additional constraint upon living-arrangement choices is that of kin availability: the number of living children, grandchildren, siblings, parents, and possibly more distant relatives conditions the range of potential shared households in which a given older woman may live. Unfortunately, data on kin availability is only rarely available for use in studies of the living arrangements of the elderly.

Some studies have incorporated measures of past fertility—i.e. number of children ever born—in an attempt to measure at least one aspect of kin availability; examples include Soldo (1981), Kobrin (1981), Wister and Burch (1983), Thomas and Wister (1984), and Christenson and Slesinger (1986). In these studies, the number of children ever born is generally found to be significantly and negatively related to the likelihood of living alone.

Less common are data which include measures of the *actual* availability of kin, not only living children but other living relatives. Tabular results presented by Shanas and others have shown that the living arrangements of the elderly vary according to the number and sex of living children, as well as the existence of other kin (Shanas, et al. 1968; Shanas, 1978). More recently, several papers have presented multivariate models of the living arrangements of older women, taking account of actual kin-availability patterns as well as other hypothesized determinants of living arrangements (Wolf, 1984; Wolf and Soldo, 1988). The present paper uses a similar approach, and extends the literature by examining the situation of older women in Canada.

Results of Canadian Studies

Recent Canadian research on the living arrangements of older women begins with descriptive studies by Harrison (1977) and by Wargon (1979). Both used 1971 census data to document the sharp postwar rise in the proportion living in one-person households, and to show that the changes were due to more than shifts in age, sex and marital status composition. Interpreting the trend, Wargon mentions a growing desire for privacy, and notes that women 65 and over in 1971 belonged to birth cohorts characterized by relatively late marriage, relatively high rates of non-marriage, and relatively low fertility.

She thus introduces the notion of kin availability as an explanatory factor. But neither she nor Harrison undertook multivariate analyses in these early studies.

In a later report, Harrison (1981) used cross-tabular analysis of 1971 census data to demonstrate a positive relationship between living alone and income, a negative relationship with fertility (children ever born), and an interaction with fertility and income—fertility was associated with living alone for women with lower incomes, but not for those with higher incomes.

Wister and Burch (1983) carried out a multiple regression analysis of the 1971 public-use census sample and showed positive relationships between living alone and age, education, and income, and a negative relationship with fertility. They also found a significant interaction of income and fertility. In assessing the results, they comment on the absence of information on health or physical disabilities, suggesting that variation in these might account for the age "effect" in their model.

A recent study by Kyriazis and Stelcner (1986) contains an analysis of widowed, separated or divorced females 50 years and older, based on data from Statistics Canada's 1979 Survey of Consumer Finances. Living arrangements are measured in terms of whether the older woman lives alone or with others. Independent variables include estimated years of education, total income, and dummy variables for occupation, mother tongue, city-size, region and age group. Contrary to most previous research and to the authors' expectations, the results show no significant relationship between living alone and income. Also somewhat surprisingly, the coefficients indicate an increasing log-odds of living alone for successive age groups, rather than decreasing log-odds as would be expected in the absence of any control for health or disability. More in accord with expectations, living alone is associated with higher education, with residence in a region other than Quebec or the Atlantic Region, with English rather than French mother tongue, and with "other" mother tongue rather than English. The authors' interpretation of the latter finding is that persons of other mother tongue may contain a higher proportion of foreign born, with a smaller kin network in which to find opportunities for co-residence. A few of the dummy variables for occupation show significant coefficients but with a "somewhat erratic" pattern; the authors conclude, however, that women in managerial occupations appear to have a higher probability of living alone.

Kyriazis and Stelcner emphasize the absence from their data set of measures of fertility (as a proxy for living children), of health status, or of attitudinal variables, all of which they believe might have significant effects on the probability of living alone, net of those variables which they were able to include. The analysis to be presented below takes advantage of the presence in the 1985 General Social Survey of direct measures of the

number of children (as well as other living kin) and of health and disability status.

Conceptual Framework and Hypotheses

Living arrangements of older persons can be thought of as reflecting the outcome of a process of constrained choice or decision making. In many contexts, including highly developed Western regions such as North America, it is assumed that this choice is made in terms of an underlying preference for individual privacy and autonomy in daily living, and thus for living with one's spouse only or alone, when this is feasible.

Feasibility can be thought of in terms of constraints or limits to choice, including income, housing costs, functional capacity for separate living, and the availability of alternative living arrangements. The latter include institutionalization, living in some form of group quarters, or the sharing of a private household with one or more other persons, usually but not necessarily relatives. With respect to co-residence with others, the older person is constrained first by the sheer existence of such others (e.g., whether she has any living children, siblings, close friends, etc.), and second by the willingness or ability of those others to share their residence.

As applied to unmarried older women, the sub-sample at issue in this paper, this general framework requires elaboration or qualification on a number of points.

1. The initial entry of an older woman into the status "living alone" is typically not a matter of choice. For widows, who constitute the vast majority (84 percent) of the sub-sample, living alone usually is initiated by the death of a husband. The choice then becomes whether to remain alone rather than actively to seek some other living arrangement. Thus, a realistic view of the process would leave room for elements of passivity and inertia.

2. Decisions regarding living arrangements may be made solely or mainly by the older woman herself, or they may involve participation by others, especially close kin. A woman's adult children, for example, represent alternative households in which she may have some claim to co-residence. But the children may also actively intervene in a decision process leading to institutionalization or to living alone, and may facilitate implementation of such a decision. It is not clear *a priori* which effect would predominate.

3. The assumption regarding a uniform preference for living alone is probably not true at the individual level, but it is difficult to modify this assumption in a way that allows for effective empirical tests. It seems likely that almost everyone would in fact place a high value on privacy and autonomy, but for some this may not rank as their

highest value; some may place companionship and family relationships higher. In addition, many would prefer a living arrangement which achieved privacy and independence without residence in a totally separate household, for example, in an in-law apartment. An apparent preference for totally separate living may partly reflect housing constraints such as zoning restrictions imposed on "single-family" dwellings.

Practically speaking, direct measures of residential preferences are possible but of limited value in a cross-sectional survey—arrangements may determine stated preferences rather than vice-versa—and in any case, such measures are lacking in the data set to be used in this analysis.

Consideration of the above conceptual framework and our review of the literature suggest the following hypotheses regarding the determinants of living arrangements of older unmarried women:

1. *Income* will be positively associated with the probability of living alone compared to other living arrangements.
2. Severe or multiple *limitations on physical activity* will be negatively associated with living alone; such limitations will increase the probability of living with adult children, siblings or other relatives or non-relatives.
3. The *number of living children* an older woman has will be negatively associated with living alone, with siblings or with others, and positively associated with living with a son or daughter.
4. *The number of living siblings* will be positively associated with the probability of living with a sibling and negatively associated with the probability of adopting any other living arrangement.
5. With controls for income and for fertility (i.e., numbers of living children), a woman's *education* may be interpreted as a proxy measure for modernity, independence, and preferences for privacy; education is thus expected to be positively associated with living alone and negatively associated with the other types of arrangements.
6. With several other variables, notably extent of limits to respondent's physical activity, controlled for, no association is expected between *age* and living arrangement.
7. The presence of grandchildren indicates "crowding" in the households of an older woman's children (Masnick and Pitkin, 1983; Burch, 1985); we expect that household crowding would reduce both the respondent's desire for and her children's willingness to provide co-residence in their households. Thus, *numbers of grandchildren* is expected to be negatively associated with living with children and positively asso-

ciated with living alone. The "crowding" hypothesis suggests no specific predictions regarding living with siblings or with others since the average number of grandchildren is not relevant to crowding in the households of siblings or of other relatives or non-relatives.

Despite earlier findings of effects on living arrangements of specific sub-cultural factors such as region, ethnicity, or language (Thomas and Wister, 1984; Kyriazis and Stelcner, 1987), these have not been included in the present analysis in order to make the present study more comparable with other national-level studies of the effects of non-cultural factors such as available kin and health/physical limitations on the living arrangements of older women (Wolf, 1988 – Hungary; Wolf, 1984 – U.S.; Wolf and Soldo, 1988 – U.S.; Wolf and Wils, 1988 – The Netherlands). Preliminary analysis not reported here suggests that subcultural patterns reported elsewhere (e.g., Kyriazis and Stelcner, 1987) become more erratic when measures of available kin are included in the model. Further work on these issues is in order.

Data

Data for this study come from the 1985 General Social Survey, the first in a projected series of annual national sample surveys conducted by Statistics Canada. Each survey in the series focuses on one or two topics, while collecting basic socio-economic data on the respondents. In the 1985 round, the focal topics were health and social support, with special attention to the elderly (Statistics Canada, 1987).

The sample was chosen from households contained in the monthly labour force survey, and was designed to represent all Canadians fifteen years of age and older with the exception of persons living in institutions and residents of Yukon and Northwest Territories. Persons ages 15 to 64 were interviewed by telephone; those ages 65 and over were interviewed personally in order to increase the sample size beyond what could be economically achieved using telephone techniques (Statistics Canada, 1987, pp. 17–18 and 229–231). In either case, all respondents reported on themselves; there was no proxy reporting.

The focus of the present analysis is on non-married (that is, never-married, widowed and divorced) women ages 65 and over. The sample contains 1,133 such women. The vast majority of these women are widows (approximately 84 percent); roughly 10 percent reported themselves as single or never-married, and another 6 percent as divorced or separated.*

*These percentages pertain to unweighted data.

The variables of interest for the present analysis can be described as follows:

— Living Kin. Respondents were asked a series of questions about the number of living kin. The specific questions were: (1) "Is your father living?" — "Is your mother living?"; (2) "Do you have any children?...If yes, how many?"; (3) "Do you have any sisters or brothers?...If yes, how many?"; (4) "Do you have any grandchildren?...If yes, how many?"; (5) "About how many other relatives have you had contact with in the last 3 months?" An additional question asked about the number of "close friends" of the respondent. Although the above questions about children, grandchildren and siblings do not specifically refer to living persons, that was their intent, and both the context and instructions to interviewers suggest that they were answered in this sense. The question on children was intended to include "natural, adopted or step children" (Statistics Canada, n.d.). Instructions to the interviewers do not further define the phrase "brothers or sisters" but the implication is that it refers to natural siblings, half-siblings and step-siblings. "In-laws," including presumably brothers- and sisters-in-law, are specifically classified as *other* relatives, along with aunts, uncles, cousins, nieces, nephews. The instructions suggest that relatives from a previous marriage should be categorized as close friends: "For example, a respondent indicates that she is close to her former daughter-in-law" (Statistics Canada, n.d., p. 6–7).

— Living Arrangements. Data on living arrangements were derived from a household roster indicating the respondent's report on the relationship of all persons to the household "head," and from questions about specific relatives, for example, "Do all of them (your children, or, your brothers or sisters) live in this household?" For present purposes, using a variety of coded items, we can assign respondents to one of the following five living arrangements: living alone, living only with "others" (that is, relatives other than children, parents, or siblings; or nonrelatives); living with a child but not with a parents or sibling; living with a parent or sibling but not with a child; living with a child and a parent or sibling. In fact, none of the sub-sample of unmarried women 65 and over lived with a parent, and none lived with both a child and a sibling; most lived either alone or with a child (see below).

Cross-classifying the respondents by living arrangements and by kin availability yields Table 1, which highlights the fact that certain cells are empty by definition; for example, a woman with no living children cannot logically report herself as living with a child. This raises methodological problems for the multivariate analysis, which are discussed below. The table shows a tabulation of living arrangements by four categories of kin availability. These data show the strong probability that an unmarried woman over 65 years of age will live alone. They also show that among the other possible living ar-

rangements, living with children is the most common; living with siblings or others are the least popular arrangements.

Table 1. Tabulation of living arrangements by kin availability.

Living Arrangement (percent)	Availability of kin			
	No siblings, no children	Siblings, no children	Children, no siblings	Siblings and children
Alone	89.4	52.6	62.4	64.8
With others	10.6	20.9	15.0	6.3
With siblings	–	26.5	–	2.3
With children	–	–	22.6	26.6

— Income. The survey contained three questions on individual income. The first asked about "...income before taxes from wages, salaries and self-employment", the second about "...income from government sources such as Family Allowance, U.I.C., Social assistance, Canada or Quebec Pension Plan or Old Age Security," and the third about "..income from interest, dividends, and private pensions." Since relatively few women over 65 reported income from employment, the present analysis defined income in terms of the sum of interest, dividends and private pensions and of government transfers. Each of these items was coded with an upper limit of $10,000 (implying a combined upper limit of $20,000) but relatively few respondents exceeded these limits so that the resulting bias should be slight. In estimating the multivariate model, a dummy variable was included for non-response on income (see below).

— Education. Respondents were asked a series of questions on both the amount and type of education received. Among women 65 and over, approximately 75 percent reported they had not graduated from secondary school; the modal years of elementary and secondary education completed was eight. For the present analysis, education was categorized as follows: elementary graduate or less; some secondary education but not a graduate; secondary school graduate; some post-secondary education.

— Limits on Physical Activity. Several specific questions were asked about the respondent's ability to perform a variety of common personal or household tasks. The wording of a typical questions in this series is: "Do you have any trouble walking up and down a flight of stairs? — (if yes) Are you completely unable to do this?" Similar questions were asked with respect to walking three city blocks without resting, carrying a

twelve pound bag of groceries about 30 feet, standing for long periods of time, bending down to pick up an object from the floor, cutting one's own toenails, using one's fingers to grasp or handle, reaching above one's head, seeing well enough (with glasses) to read ordinary newsprint, and hearing a normal conversation.

Two measures of physical disability are used in the present analysis, the total number of activities which the respondent reported as difficult but not completely impossible, and and the total which they reported themselves as completely unable to perform. A high score on either would seem to suggest that the respondent would be ill-suited for particular living arrangements, especially living alone.

The measurement of numbers of living children, siblings and grandchildren is straightforward. The last is an average—the number of grandchildren divided by number of children; women with no living children are treated as though they had zero grandchildren—since the data do not permit us to associate specific grandchildren with specific children. The average values for independent variables are shown in Table 2.

Table 2. Average values of variables used in multinomial logit analysis.

Variable	Sample mean
Number of children	2.45
Number of siblings	2.90
Grandchildren per child	1.56
Number of activities "difficult"	2.12
Number of activities "unable"	0.84
Nonwage income ($1000s)	5.94
Nonwage income not measured*	0.28
Age = 80+*	0.27
Education 8–11 years*	0.46
Second education*	0.12
Postsecondary education*	0.19

*Dummy variables

Methods

Our multivariate analysis of living arrangements uses an approach virtually identical to that found in Wolf (1984). The purpose of the model is to explain the distribution of older unmarried women across the several categories of the dependent variable, living arrangements. The distribution of living arrangements is postulated to depend upon several

explanatory factors, including the availability of kin. Of particular importance is the fact that certain categories of the dependent variable—for example, living with one or more children—can be observed only if a certain type of kin—in the example, children—actually exist. The technique used is a straightforward adaptation of the multinomial logit technique (Amemiya, 1985). The multinomial logit approach allows us to model the probability that a sample individual will be observed in each of the possible categories of the multi-categorical dependent variable.

Specifically, let the four categories of the living arrangements variable, discussed previously, be represented by the indices a (alone), o (with others), c (with children), and s (with siblings). Recall that none of our sample is observed to live in the additional, logically possible category "with children and siblings". Note that the first two categories, living alone or with "others", are categories which do not depend upon the existence of any type of kin. Further, for the ith sample individual let $C_i = 1$ if i has any living children, while $C_i = 0$ otherwise; similarly, let $S_i = 1$ if i has living siblings. Finally, let $\boldsymbol{X}_i$ represent the array of explanatory variables associated with i.

Using the notation just defined, the multinomial logit specification represents the probabilities that i will be observed in each of the possible living-arrangements categories with equations of the form

$$pr(\text{living arrangement} = c) = \tag{1}$$

$$\frac{C_i e^{\boldsymbol{B}_c \boldsymbol{X}_i}}{e^{\boldsymbol{B}_a \boldsymbol{X}_i} + e^{\boldsymbol{B}_o \boldsymbol{X}_i} + C_i e^{\boldsymbol{B}_c \boldsymbol{X}_i} + S_i e^{\boldsymbol{B}_s \boldsymbol{X}_i}}$$

and so on, for each of the other living-arrangements categories. Note that for someone without living children (i.e. for whom $C_i = 0$) the probability of living with children automatically becomes zero. The denominator in (1) is defined in such a way that the probabilities of the different types of living arrangements will sum to one. The unknown parameters of this model are the vectors $\boldsymbol{B}_a$, $\boldsymbol{B}_o$, $\boldsymbol{B}_c$, and $\boldsymbol{B}_s$. However, the restriction $\boldsymbol{B}_a = 0$ is used to identify the rest of the parameters, and thus the category "living alone" becomes the baseline or reference category. The remaining parameters are estimated by standard maximum-likelihood techniques.*

*Our estimates are obtained using an appropriately-modified version of the CRAWTRAN program (Avery, 1980). Details are available from the first author on request.

Interpretation of the estimated parameters is complicated by the nonlinear relationship between explanatory variables and the probabilities of each of the categories of the dependent variable. An individual parameter—that is, an element of one of the B-vectors—indicates the quantitative relationship between its associated variable and the *relative* probabilities of the corresponding category (either living with others, with siblings, or with children) and the reference category (living alone). For example, the odds of living with children (given that they are available), relative to living alone, are $exp(B_cX)/exp(B_aX)$; thus the log of these odds equals $(B_c - B_a)X$ or simply B_cX since $B_a = 0$. If some element of B_c equals zero, then we conclude that the corresponding variable doe not affect the relative probabilities of living with children and living alone. If *all* the elements of B_c were zero, then our model implies that the probabilities of living with children or alone are equal (i.e. the odds are 1:1). More informative than the parameters themselves are the absolute probabilities of the categories of the dependent variable, given specified values for the array X; these are calculated by substituting the specified X and the estimated parameters into equation (1).

Results

Tables 3 through 5 present the results of our multinomial logit analysis of living arrangements. Table 3 gives the logistic coefficients and associated t-values; these show the log-odds of living in the given category relative to living alone—the omitted category. Tables 4 and 5 show calculated probabilities of living in each of the various living arrangements for specific combinations of values of the independent variables. As noted above, the information in Tables 4 and 5 may be more informative than the logistic coefficients. They are especially helpful in identifying situations where a coefficient is significant but nonetheless the variable in question has only a small effect on the probabilities.

The results for income, physical limitations and age are all as predicted. Women with higher incomes and fewer severe incapacitating conditions are more apt to live alone rather than in any of the other three arrangements. Age, net of physical limitations, appears to have no systematic effect. A possible exception to this statement is the significantly greater likelihood of living with others rather than alone. It may be that, even if she has no specific health or physical problems, as a woman gets older she may be more inclined to seek a co-resident for general companionship and/or domestic help.

Table 3. Estimated parameters of multinomial logit model of living arrangements.

Variable	Effects on living with: Others	Siblings	Children
Number of children	-0.065	-0.446	0.130
	(1.28)	(3.35)	(3.81)
Number of siblings	0.126	0.065	0.007
	(3.70)	(1.62)	(0.21)
Grandchildren per child	-0.096	-0.646	-0.280
	(1.36)	(3.38)	(4.34)
Number of activities "difficult"	0.032	-0.116	0.031
	(0.58)	(1.53)	(0.80)
Number of activities "unable"	0.218	0.134	0.157
	(3.93)	(1.6)	(2.94)
Nonwage income ($1000s)	-0.104	-0.084	-0.107
	(2.50)	(1.76)	(3.39)
Nonwage income not measured	-0.509	-1.122	-1.417
	(1.27)	(2.23)	(4.49)
Age = 80+	0.481	-0.275	0.012
	(1.93)	(0.76)	(0.06)
Education 8–11 years	-0.274	0.140	-0.411
	(1.13)	(0.44)	(2.21)
Secondary education	-0.784	0.042	-0.467
	(1.84)	(0.08)	(1.58)
Postsecondary education	0.609	-0.109	-0.306
	(2.23)	(0.30)	(1.20)
Intercept	-1.513	-0.208	0.244

Note: absolute values of t-statistics shown in parentheses

The results for education are somewhat erratic and provide only partial support for the "taste" hypothesis outlined above. Women with at least some post-secondary education appear to be more apt to live with others than to live alone. It is possible that they have more modern attitudes toward non-traditional living arrangements (i.e., co-residence with other than nuclear-family kin). It also is possible that because of their post-secondary education they may have had more experience with non-nuclear family living arrangements. Finally, those with post-secondary education may be concentrated among the single or never-married, who in general tend to have somewhat different living patterns than the formerly married (further analysis of the role of marital status is desirable but hampered by the small numbers of single and of divorced women in our sub-sample). The other significant education effect is that any education above the lowest level (less

Table 4. Predicted probabilities of living arrangements: effects of selected variables.

	Living arrangement			
	Alone	With others	With siblings	With children
1. Reference individual*	0.521	0.166	0.038	0.276
Effects of disability:				
2. Number of activities "unable" = 0	0.627	0.066	0.051	0.256
3. Number of activities "unable" = 3	0.505	0.103	0.062	0.330
4. Number of activities "unable" = 6	0.382	0.149	0.070	0.400
Effects of income:				
5. Income ($1000s) = 0	0.434	0.106	0.067	0.392
6. Income ($1000s) = 10	0.685	0.059	0.045	0.211
7. Income ($1000s) = 15	0.785	0.040	0.034	0.141
Effects of education:				
8. Less than 8 years	0.507	0.088	0.041	0.365
9. Secondary education	0.619	0.049	0.052	0.279
10. Postsecondary education	0.521	0.166	0.038	0.276

*The characteristics of the reference individual are: number of children = 2; number of siblings = 3; number of grandchildren per child = 1.56; number of activities "difficult" = 2; number of activities "unable" = 1; nonwage income = $5940; education = 8–11 years.

Table 5. Predicted probabilities of living arrangements: effects of kin-availability variables.

	Number of living kin			Living arrangement			
	Siblings	Children	Grandchildren per child	Alone	With others	With siblings	With children
1.	0	0	0	0.868	0.133	0.0	0.0
2.	0	2	0	0.548	0.057	0.0	0.395
3.	0	2	2	0.667	0.058	0.0	0.275
4.	0	2	4	0.765	0.055	0.0	0.180
5.	2	2	0	0.475	0.064	0.114	0.348
6.	2	2	2	0.627	0.070	0.041	0.262
7.	2	2	4	0.741	0.068	0.013	0.177
8.	3	1	1.56	0.685	0.082	0.086	0.246
9.	3	2	1.56	0.588	0.077	0.055	0.280
10.	3	3	1.56	0.579	0.071	0.035	0.315
11.	3	4	1.56	0.564	0.065	0.022	0.349

than completion of elementary school) tends to lower the probability of living with children versus living alone.

The results provide strong support for the view that kin availability is a major constraint on living arrangements of older women. The number of children has no apparent effect on the probability of living with others versus living alone (a negative coefficient which is not significant at .05 level). But it has a strong positive effect on the probability of living with children rather than alone, and a strong negative effect on the probability of living with siblings rather than alone. The number of siblings has a significant effect on the probability of living with others versus living alone, but as seen in Table 5 the effect is quantitatively trivial. Also, the number of siblings has a strong effect on the probability of living with siblings versus alone, but no effect on the probability of living with a child. These results, along with the descriptive data in Table 1, suggest that in the Canadian context the nuclear family solidarity reflected in the appreciable proportions of older women living with sons or daughters does not extend to siblings.

In the multivariate model, having more siblings does not decrease the probability of living with a child, whereas having more children does decrease the probability of living with a sibling. In Table 1, it can be seen that among women with both children and siblings, the proportion living with a child is about twelve times higher than the proportion living with a sibling. Among those who have siblings but no children, the proportion living with some other relative or with a non-relative is almost as high as the proportion living with a sibling. This finding is in keeping with a recent classification of nations by type of family, which would assign Canada to categories not noted for the promotion of solidarity among siblings (Todd, 1985).

The average number of grandchildren has a highly significant and large negative effect on the probability of living with a child or with a sibling; its effect on living with others versus alone is also negative but not significant. The result with respect to living with a child is as predicted based on the household crowding hypothesis. The result with respect to living with siblings is unexpected since, as noted above, the respondent's average number of grandchildren is irrelevant to the size of her siblings' households. Two after-the-fact explanations may be suggested. The first is that older women with several grandchildren may be inclined to retain their own household rather than living with other persons of any category in order that they may freely entertain and provide for visits from their grandchildren (as well as the grandchildrens' parents). Were they to live with one of their children or with a sibling, their freedom in this regard would be compromised. This explanation would also account for the negative (but non-significant) relationship with living with others. A second, related explanation is that an older woman may not

wish to have any kind of preferential relationship with one or another set of her grandchildren, but wishes to treat all equally. Living with one of her children would run the risk of such an asymmetric relationship, since she would be in daily contact with some of her grandchildren but not others. Living with a sibling might mean that her wish to entertain or receive visits from her grandchildren would conflict with similar wishes on the part of her sibling to entertain the sibling's grandchildren. Whether a similar argument would pertain to co-residence with other relatives or with non-relatives would depend on the latters' household composition vis-à-vis children and grandchildren.

To summarize regarding the strong statistical results on average numbers of grandchildren, there is some support for the crowding hypothesis, but other explanations must also be invoked.

Discussion

A multivariate analysis of recent survey data from Canada has confirmed earlier findings regarding the importance of income and of physical disabilities as determinants of the living arrangements of older unmarried women, that is whether they live alone or with others. Taking advantage of relatively rare data on numbers of living kin, the analysis also has given strong support for the constraining effect of living kin. In particular, whether a woman lives alone, with a sibling or with one of her children is strongly dependent on her number of living children. A still more surprising effect relates to fertility (and hence number of living children) in the third generation. A respondent's average number of grandchildren per child has large negative effects on the probability that she will live either with a child or with a sibling rather than live alone.

The model has not included some other factors that may have some relevance, and so is not complete or definitive. The 1985 General Social Survey was lacking in measures of respondent's attitudes towards or tastes for various living arrangements, as well as community-level variables relating to the availability, type and costs of housing. In addition, as noted above, further disaggregation by marital status or by sub-cultural factors such as region, language or national origins has been left to future analyses.

Since much interest attaches to the relevance of a model such as this for projections of future household patterns, a few speculations about the future may be in order. Based on past studies it has been common to speculate that a decline of fertility would tend, other things equal, to increase the proportion of older unmarried women living alone or as heads of households containing only non-relatives (Kobrin, 1973; Burch and Matthews, 1987). The present finding regarding numbers of children supports this view, but that re-

garding numbers of grandchildren suggests that the effect of low fertility could be equivocal: older unmarried women in the future will have fewer children with whom they might live, but those children's households will be less crowded with grandchildren. More refined speculations would have to take account of the timing of fertility change. They would also have to take account of possible changes in attitudes of future cohorts of older women. Traditionally, older unmarried women lived with kin, especially their children. Recent decades have seen major departures from this tradition, notably the increase in the proportions living alone. Future cohorts, who will have experienced more cohabitation and other non-marital coresidence with non-kin and more divorce may well bring to their later years new attitudes towards living arrangements, especially those involving non-relatives.

The findings point to the importance of including data on kin in future surveys. Ideally, such data would be even more specific as to categories of kin, and would include information on the characteristics of the kin as well as of the respondent. The geographical location of sons and daughters, for example, may well be an important factor influencing whether an older woman would wish or be able to co-reside in one of their households. Clearly, information on the actual number of grandchildren for each child and whether they still live at home would also be of great interest. Finally, information on tastes and attitudes would be of interest, but its usefulness for causal inference will be greatly limited without a longitudinal or prospective survey design.

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