

Living arrangement choices of elderly singles: Effects of income and disability

by Christine E. Bishop

Logit regression is used to explain living arrangement choice of elderly single individuals. The propensity to live independently is found to increase with income and decrease with disability; an interaction effect for females suggests that income may lessen the impact of disability on the propensity to seek shared living arrangements. Independent living is less likely for people who are not white, foreign-

born males, those with at least one adult child, and those in States with higher living costs; and more likely for the ever-married and those in States with high per capita nursing home use. If home care services are preferentially allocated to disabled elderly who live alone, resources may flow to higher income individuals who have been able to maintain independent households.

Introduction

The living arrangements of the disabled community-resident elderly can have a profound effect on their need for formal long-term care services. The well-documented (Kobrin, 1976; Michael et al., 1980; Pampel, 1983) trend of single Americans toward living alone thus takes on special significance for long-term care planning for the unmarried elderly. Nearby family members and friends assist many disabled older people who live alone (Shanas, 1979). However, by definition, elderly people living alone will be unable to rely on other household members should they need help because of a disabling condition. Without the availability of in-house assistance, the disabled person must turn to other sources of care, either formal or unpaid. In some situations, the presence of another person in the household is required for round-the-clock response to unpredictable needs. Thus, for the older person living alone, the onset of disability is more likely to necessitate a change of living arrangement, possibly institutionalization, or to result in unmet need.

The number of elderly Americans who live alone had grown to 7 million people by 1980, representing 27.7 percent of the population 65 years of age or over. Because they often outlive their spouses and are less likely to remarry, the proportion of older females living alone (5.6 million or 36.9 percent of females 65 years of age or over) is much greater than the proportion of older males (1.4 million or 14.1 percent of males 65 years of age or over). Yet the proportion of elderly persons living alone is similar for females and males when only the unmarried, noninstitutionalized population 65 years of age or over is considered: In 1980, 63.2 percent of the elderly community-resident unmarried females lived alone, as did 58.3 percent of the males (Table 1).

It is important to understand the effects of various factors on the trend toward living alone. During recent decades, females who might provide family support to older people have increasingly joined the paid labor force; divorce has disrupted many families; the longevity gap between females and males has not decreased, so that widows remain a high proportion of older females; and lower current fertility rates mean that tomorrow's elderly will have fewer adult children to whom they might turn for support. At the same time, the real income of older Americans has risen significantly, and with increasing longevity has come the possibility of a decrease in age-adjusted disability (Fries, 1980; Manton, 1982). These trends appear to have enabled many older people to choose an independent life style. Future shifts in all these factors may have important implications for the rate at which older people live alone and hence on the cost of long-term care.

The purpose of this article is to examine more closely the increasing propensity of unmarried older people to live independently rather than with relatives or friends. The general approach of the study is that of the economics of consumer choice, which assumes that individuals make decisions that maximize their well-being, subject to constraints on income and available alternatives for choice.¹ This approach allows identification of the factors that influence the decision to live independently, and it suggests how future levels of income, incidence of disability, and rates of fertility, marriage, divorce, and widowhood may be expected to affect the proportion of the elderly living independently.

Model of living arrangement choice

Consumer choice theory postulates that an individual making a decision between two discrete alternatives will implicitly evaluate his utility or well-being under each choice and choose the alternative

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Reprint requests: Christine E. Bishop, Ph.D., Health Policy Center, Heller Graduate School, Brandeis University, Waltham, Massachusetts 02254.

¹Two other studies have recently used similar approaches to model living arrangement decisions (Schwartz, Danzinger, and Smolensky, 1984; Wolf, 1984). Both make use of the Longitudinal Retirement History Survey, and thus deal only with the "young" elderly (60-71 years of age).

Table 1
Percent distribution of persons 65 years of age or over, by sex and type of living arrangement: Selected years 1965-80

Type of living arrangement	1965		1970		1975		1980	
	Female	Male	Female	Male	Female	Male	Female	Male
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
With spouse	34.1	67.9	33.9	69.9	35.6	74.0	34.7	71.8
Institution or group quarters	4.7	3.8	5.0	4.5	5.6	4.4	7.0	4.0
Community resident not with spouse	61.2	28.3	61.2	25.6	58.8	21.5	58.4	24.2
Independent ²	28.6	13.1	33.8	14.1	36.0	14.2	36.9	14.1
	(46.7)	(46.3)	(55.2)	(55.1)	(61.1)	(65.8)	(63.2)	(58.3)
With others ²	32.6	15.2	27.4	11.5	22.8	7.4	21.5	10.1
	(53.3)	(53.7)	(44.7)	(44.9)	(38.8)	(34.2)	(36.8)	(41.7)

¹Totals may not add to 100.0 because of rounding.

²Percent of total community residents not with spouse shown in parentheses.

SOURCE: U.S. Bureau of the Census: 1980 Census of Population, Volume 1, Chapter D, Part 1, PC 80-1-D1-A. Washington, U.S. Government Printing Office, Mar. 1984.

providing the higher level of well-being. The probability that individuals will live independently ($P(I)$) is thus equivalent to the probability that their utility of living independently (U_I) is greater than the utility of the best shared living arrangement (U_{SL}):

$$P(I) = P(U_I > U_{SL}).$$

This probability depends on two types of factors: first, differences between the alternatives that may make one preferable to the other; and second, preference of the individual decisionmaker with respect to these characteristics. Within this framework, a model of choice for living arrangement decision of the unmarried elderly must capture relevant aspects of individuals' alternatives as well as aspects of individual tastes and characteristics that may affect their evaluation of these alternatives.

The model assumes that individuals will be observed living alone or with others with a probability depending on their current characteristics, as if they continually sought the optimal living arrangement choice. In contrast to some other consumer decisions that are made daily or weekly, living arrangement has substantial inertia and is unlikely to be changed as rapidly as independent variables change. On the average, however, the model can be used to explain current living arrangements. Longitudinal studies are needed to study transitions in living arrangements that are presumably the result of changes in independent variables; however these studies must recognize the persistence of past choices, as indicated by models like the one considered here.²

The variables will be discussed in turn in the following sections.

²The author and others, in work funded by the National Institute on Aging (AG04803), are using the National Housing Survey to examine active and passive living arrangement transitions of the elderly. Also, the National Long-Term Care Survey will provide a view of 2-year transition rates for elderly disabled persons.

Income

Income of the individual and of the best alternative household that might be joined does much to determine the relative attractiveness of the alternatives. In many cases, sharing a household allows an individual to save on living expenses and to consume more of other goods and services than would otherwise be possible, but at the expense of privacy and independence. Older people express strong preferences for maintaining independent households (Lopata, 1971; Schorr, 1980). It has been argued that independent living is what economists term a "normal good," in other words that more is purchased as income rises. When income is used as a variable in cross-sectional studies of individual behavior, it has been shown to have a positive effect on the propensity to live independently (Kobrin, 1981; Schwartz et al., 1984; Soldo and Lauriat, 1976; Wolf, 1984). Other analysts (Beresford and Rivlin, 1966; Michael et al., 1980; Pampel, 1983) have studied aggregate national and State data over time, and they conclude that rising real incomes of the elderly are responsible for at least some of the increase in the proportion of single individuals living alone. This analysis is confined to a one-time cross-section and tests the hypothesis that the single elderly with higher income are more likely to live alone.

Disability

A disabled person is expected to place a higher value on the presence of assisting household members, so that disability is hypothesized to increase the propensity to live with others. Disability measures have not been included in many available surveys, so this effect has not been widely studied. Schwartz et al. (1984), Soldo et al. (1981), and Wolf (1984) were able to include disability information in their models and to find some support for this hypothesis.

Joint effects of disability and income

Informal in-house assistance becomes more valuable with greater disability. Yet individuals can alternatively spend their income on some needed services and still maintain independent living arrangements. Because disability may be seen as increasing the price of maintaining independence, it is hypothesized that the effects of disability and income are not additive; the purchase of privacy by people with higher incomes should respond less to disability than that by people with low incomes who face a similar "price increase" for independent living.

Adult children

The unmarried elderly who live with others often share households with their adult children. The strength of family ties, especially between mothers and daughters, has been well documented (Schorr, 1980). Bachrach (1980) found a nonlinear relationship between the number of living children and the probability that previously married older persons lived alone. She concluded that childlessness was a more important predictor of living alone and social isolation than was variation in the number of adult children. In terms of the current model, if individuals have adult children, their best shared-household alternative is likely to be with their own offspring, making the best shared-living alternative more attractive relative to living alone than it would be for a person with no adult children. The number of living adult children might also affect the attractiveness of the best shared-living alternative because the choice among households and the probability of daughters would increase.

Characteristics affecting tastes and alternatives

A number of attributes of older people have been associated with varying preferences for independent living (Belcher, 1967; Chevan and Korson, 1972; Lopata, 1971; Robinson and Thurnher, 1977; Troll, 1971; Schorr, 1980; Shanas and Sussman, 1981; and Oppenheimer, 1981). For example, females are found to maintain stronger family ties than males, implying that they are more likely to be comfortable in extended family living situations. The high prevalence of multigenerational households among persons who are not white and among the foreign-born has been explained by cultural factors supporting multigenerational living. Homemaking skills may also effect the relative attractiveness of living alone versus living with others. Individuals with few homemaking skills may have more to gain from living with others and may be more likely to choose a shared-living alternative. It is hypothesized that females and never-married males are more likely to live alone, other things constant, because of their greater experience in maintaining independent households. In this study,

separate equations will be estimated for females and males. The effects of other personal characteristics will be evaluated holding income, disability, and other factors constant.

Environmental factors affecting living arrangements

Variations in the cost of living across regions may affect the relative attractiveness of shared versus independent living arrangements, other things being constant. The per person expenditure necessary to reach a given real standard of living is greater for a person who lives alone than it is for a person who shares a household with others, and this difference increases as the cost of living increases. Thus, other things being equal, it is expected that the consumer price level will have a negative effect on the propensity to live independently.

Elderly individuals making use of another alternative living arrangement, institutional care, are by definition omitted from any survey of community-resident elderly. The availability and use of nursing home care varies significantly across States, meaning that this living arrangement alternative is used by a varying proportion of State residents. In a State with few nursing home beds available, a given level of disability might cause individuals to live with others; but in a high-use State, they might instead be able to enter a nursing home, thus leaving the sample frame altogether. Alternatively, the rate of nursing home use could be the result of persistent regional patterns of family responsibility and shared-living arrangements, so that more beds are built in States where shared living is less common. Either explanation should result in a positive association between nursing home use and independent living, and both imply that this variable should not be omitted from the analysis. It is therefore hypothesized that the observed propensity to live independently rather than with others is greater in States with greater nursing home use.

It should be noted that characteristics affecting the probability of shared living are likely to affect the use of chronic institutional care as well. Cross-sectional studies of the observed living arrangements of the elderly should ideally cover the entire population, and include nursing home residence as a living arrangement alternative.³

To summarize, it is hypothesized that the probability of living independently is positively related to income and negatively related to disability, and that the effect of the interaction term is positive, reducing the negative impact of disability on the propensity of high income people to live independently. The foreign-born elderly and persons who are not white are hypothesized to be less likely to live alone, as are those who live where the cost of

³The authors and others, in a project previously cited, are using a combined sample of institutionalized and community-resident elderly to address this question.

living is high and those with adult children. Marital status is included in the model as a proxy for skills and experience for independent living, with the hypothesis that never-married individuals are more likely to live alone. Separate equations are estimated for males and females, because the effects of various characteristics (e.g. widowhood, income, adult children) on living arrangement are likely to differ by gender. Finally, per capita nursing home use is included to account for differences across States in the availability of this alternative living arrangement.

Data

Survey description

The Current Population Survey (CPS) subsample of the Survey of Low Income Aged and Disabled (SLIAD) includes information on the 1973 living arrangements, incomes, disabilities, and number of living children for 1,814 unmarried, noninstitutionalized individuals 65 years of age or over. A full description of the survey methods is given in Barron (1979). All residents in homes for the aged were excluded from the sample frame, along with those in other institutions. The sample frame for the unmarried includes only those individuals whose incomes for the year, July 1972 to June 1973, was less than \$5,000. These individuals comprised a substantial proportion of the Nation's nonmarried elderly.⁴ It is important to note that the SLIAD was not limited to a particular age cohort of the elderly as the longitudinal surveys analyzed by others (Schwartz et al., 1984; Wolf, 1984) have been. During the survey, information was gathered about living children, in contrast to many surveys that include only adult children residing in the respondent's household. Although results from a limited sample should not be generalized to the entire unmarried population, findings are expected to apply to that segment of the population most likely to rely on Medicaid for long-term care, and results are expected to suggest directions for future analysis of more ideal data sets.

Variables

Means and standard deviations for the variables used in the study are presented in Table 2. The dependent variable, living independently (*I*), was set equal to 1 if the surveyed individual lived alone; *I* equals 0 if the individual lived with others. Information was available on nativity (FORBN = 1 if foreign-born), race (NONW = 1 if other than white), and income (Y)—the total of income from all sources for the respondent. The square of income (YSQ) was also included in the analysis to capture any decreasing marginal effects as income rises. The number of living

⁴Of the Nation's unmarried individuals 65 years of age or over with incomes in 1973, 75.6 percent of males and 86.1 of the females had income less than the \$5,000 SLIAD criterion (U. S. Bureau of the Census, 1976).

Table 2
Means and standard deviations for study variables for unmarried persons 65 years of age or over, by sex

Variable	Female	Male
Number of observations	1,421	393
I: living independently	.603 (.489)	.606 (.489)
FORBN: foreign-born	.135 (.342)	.183 (.387)
NONW: other than white	.122 (.328)	.178 (.383)
Y: income	2,417.6 (1,553.8)	2,861.7 (1,798.8)
CHILD: 1 or more living children	.754 (.431)	.603 (.490)
MORE: number of children more than 1	1.60 (2.11)	1.43 (2.19)
WIDOW: widowed	.829 (.377)	.565 (.496)
DIVOR: divorced	.054 (.226)	.132 (.339)
SEPAR: separated	.027 (.161)	.102 (.303)
YPC73: State per capita income, 1973	4,954.0 (624.0)	4,997.8 (606.6)
RESPC73: State nursing home residents per 1,000 elderly, 1973	55.76 (16.98)	54.52 (16.51)
DISAB1: self-care factor	-.0182 (.9665)	.0584 (.9121)
DISAB2: mobility factor	.1127 (.9084)	-.0707 (.8554)
AGE	75.06 (6.87)	75.07 (6.68)

NOTES: Data based on Survey of Low Income Aged and Disabled, Current Population Survey subsample. Income limit for sample was less than \$5,000. Standard deviations are shown in parentheses.

children was treated as two variables: a dummy variable CHILD set equal to 1 if the respondent reported any living children, and continuous variable MORE indicating the number of living children above one. Marital status was represented by four dummy variables: widowed, divorced, separated, and an omitted case, never married. State per capita income (YPC73) serves as a proxy for State wage and price levels. A variable measuring State nursing home use, residents per 1,000 elderly (RESPC73), was included to reflect wide, persistent regional differences in availability and use of institutional care.

Nine responses about abilities to carry out everyday tasks that included grocery shopping, dressing, bathing, meal preparation, and leaving home were used to measure disabilities. The data were collapsed into two factor scores. The first factor score, labeled DISAB1, accounted for 48.0 percent of the variation in these nine variables, and it was highly related to inability to carry out basic activities necessary for independent living. Those scoring high on this factor were unable to dress, bathe, and leave home. This factor also was correlated with the inability to do light housework and prepare one's own meals. The second factor, DISAB2, accounted for an additional 15.3

percent of the variation in the nine variables and reflected general mobility and strength. It was inversely related to ability to leave home without help and to grocery shop, and, to a lesser extent, to the ability to prepare meals and do heavy and light housework. In the presentation of results that follows, the disability factors are named "self-care" and "mobility." Variables measuring age and its square were also included to represent general frailty that might not be picked up by disability measures.

Results

Logit analysis (Amemiya, 1981) was used to estimate separate equations for 1,421 unmarried females and 393 unmarried males (Table 3); the coefficients for the females achieve a high level of significance. The equation for the smaller sample of males is not as convincing, but it provides interesting similarities and contrasts. The log likelihood chi-square test and the pseudo- R^2 ($\rho^2 = 1 - \text{ratio of the log likelihood of the model to the log likelihood of a model with constant term only}$) show a reasonable level of overall significance for the equations. The coefficients show the direction of effects of the independent variables on the probability of living independently; however, they must be evaluated at specific values to find the magnitude of the effects. This is because logistic regression analysis uses as a dependent variable the natural logarithm of the ratio of the odds of living independently:

$$\ln \frac{P(I)}{1-P(I)} = \sum b_j x_{ij} + \epsilon_i$$

where $P(I)$ = probability of independent living

b_j = coefficients to be estimated

x_{ij} = independent variables

ϵ_i = error term

This means that the probability that individuals will live alone can be predicted by inserting their values for the independent variables and solving for $P(I)$, as in the following equation:

$$P(I) = \frac{e^{\sum b_j x_{ij}}}{1 + e^{\sum b_j x_{ij}}}$$

The effect of each independent variable on the probability of living alone is not easily derived from its estimated coefficients because its effect varies, depending on the base-line probability implied by the other independent variables. These effects are best understood by evaluating them for selected base cases, for example, for white, widowed females with mean income and disability.

Table 3
Logistic regression estimates for variables, by sex

Variable	Female	Male
Number of observations	1,421	393
Dependent variable: I = 1 if, living independently		
Constant	-8.352 (6.533)	-12.728 (13.250)
FORBN: foreign-born	-.0614 (.182)	* -.526 (.320)
NONW: other than white	*** -.787 (.195)	-.223 (.324)
Y: income	***.000351 (.000100)	.000278 (.000170)
YSQ: income squared (0000)	* -.000167 (.00010)	-.000219 (.000150)
CHILD: 1 or more living children	*** -1.194 (.209)	** -.807 (.356)
MORE: number of children more than 1	-.0385 (.0306)	-.0470 (.0618)
WIDOW: widowed	***1.801 (.267)	** .908 (.409)
DIVOR: divorced	***2.321 (.381)	.203 (.451)
SEPAR: separated	***1.308 (.436)	*.989 (.532)
AGE	.234 (.171)	(.330) (.344)
AGESQ: age squared	-.00150 (.00112)	-.00201 (.00112)
DISAB1: self-care factor	*** -.583 (.167)	-.175 (.321)
DISAB2: mobility factor	*** -.555 (.141)	*** -.905 (.333)
YDIS1: Y x DISAB1	.000097 (.000080)	-.000101 (.000150)
YDIS2: x DISAB2	*.000096 (.000060)	.000055 (.000120)
RESPC73: State nursing home residents per 1,000 elderly, 1973	***.00957 (.00370)	-.0109 (.0072)
YPC73: State per capita income, 1973	*** -.000398 (.000110)	-.000022 (.000210)
-2 log likelihood ratio (χ^2)	245.83	71.71
ρ^2	.128	.136

NOTES: Standard errors are in parentheses. Significance levels: * = 10 percent, ** = 5 percent, and *** = 1 percent.

Income

Income has a significant positive effect on independent living for females. The effect for males is also positive but smaller and significant only at the 10.3-percent level. The coefficient for the square of income shows that income has a decreasing effect on the propensity to live independently. Although base-case females (white; widowed; native born; with adult children, mean income for females, average disability

for females) were less likely to live with others than base-case males, the gap would be closed by an increase in their income to the mean level for males (Table 4). The females' decision to live alone is more responsive to income than the males': the elasticity of the propensity to live independently, computed at the base-case mean income and modal characteristics, is .227 for females and .144 for males.

Table 4
Predicted probability of independent living, by sex and income level

Income	Female	Male
\$1,000	.542	.586
\$2,000	.617	.634
\$2,418 ¹	.645	.651
\$2,861 ²	.672	.671
\$3,000	.680	.670
\$4,000	.730	.695
\$5,000	.770	.710

¹ Mean for females.

² Mean for males.

NOTE: Base case = white, widowed, mean age and children, native-born, disability factors at mean for each sex.

Disability

The disability factor scores, based on abilities to carry out various tasks, had a significant effect on independent living for females. As expected, the less disabled are more likely to live independently, other things being constant. The direction of the effect was similar for males, but it was only significant for the second disability factor, reflecting mobility.

Joint effects of income and disability

The positive signs for the interaction terms in the females' equation indicate that females used higher income to compensate for higher disability levels. The interaction between income and mobility is significant at the 10-percent level, and the coefficient for the interaction between income and self-care is greater than its standard error. The interaction terms for males are not statistically significant. Table 5 and Figure 1 show the predicted probabilities of living with others for females with various income and disability levels. The equation predicts that females

Figure 1
Effect of income and disability on the probability of independent living by women

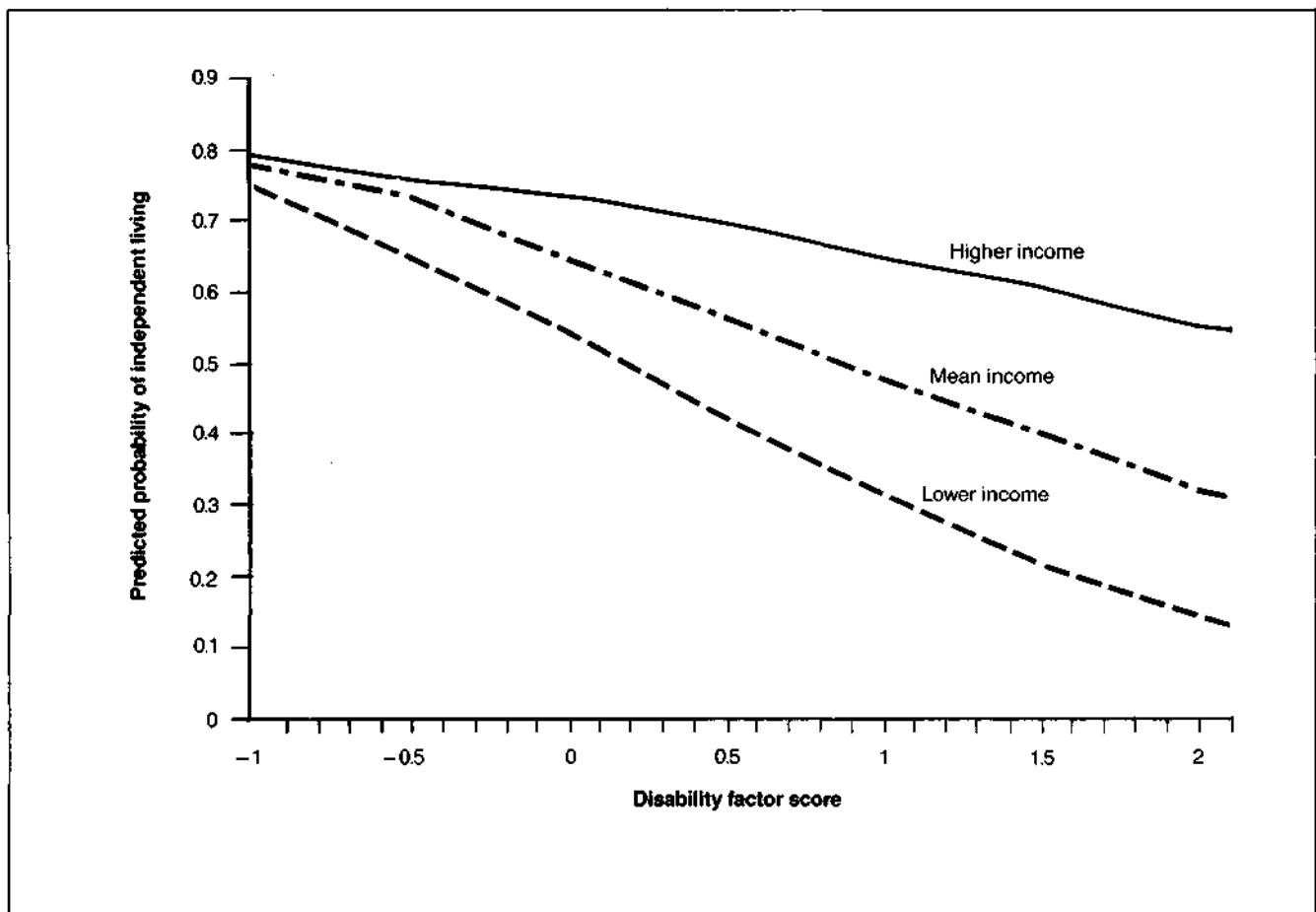


Table 5
Predicted probability of independent living for females 65 years of age or over, by income and disability

Income	Disability			
	Low	Average	Moderate	High
Low	.758	.530	.310	.145
Average	.786	.645	.489	.328
High	.799	.729	.655	.567

NOTE: Base case = white, widowed, native born, mean children.

with lower incomes and of all disability levels are more likely to live with others than are those with higher incomes and similar disabilities. This income effect is larger for the more disabled. Although increasing disability decreases the probability of living alone, disability causes smaller declines in the probability of independent living as income rises.

Adult children

Existence of at least one living child has a large and statistically significant effect on the propensity of unmarried elderly people to live independently, with a greater effect on females than on males. The existence of at least one adult child decreases the probability of living alone by about 31 percent for females and 17 percent for males, other things held constant. The existence of more adult children, indicated by the variable MORE, should open wider choice to the older person and increase the probability of having adult daughters, who are more likely to assist older parents. However, this variable had a small and insignificant effect.

Personal characteristics and alternatives

Females who are not white are significantly more likely to live with others even after accounting for their lower incomes. This cultural effect is so strong that females who are not white with incomes two standard deviations above the mean for all females are still more likely to live with others than white females are at the mean income level. This implies that the observed tendency of elderly persons who are not white to live with others is not because of their lower incomes alone; culturally determined preferences, or the needs of the sharing household for combined income or child care, are also important. This counters the conclusion of Soldo and Lauriat (1976) that race is not important to the propensity to live alone once income is accounted for. At the least, the current analysis indicates that race should be included in the analysis of living arrangement choice—in contrast to Kobrin (1981). Interestingly, foreign-born status had a significant negative effect on the propensity of males to live alone, but foreign-born females were not significantly less likely to live alone once income, disability, and other factors were accounted for. Unexpectedly, the never married of

both sexes are less likely to live alone than widowed, divorced, and separated males and females are, holding constant existence of children and other factors. This may indicate development of long-term shared arrangements by this group. Alternatively, the ever married, with wider kin networks, may have developed better nonhousehold sources of assistance that allow them to maintain independence despite some disability.

Environmental factors

The State income variable had a significant negative coefficient. This variable, a proxy for State cost of living, shows the effect of prices for helping services and costs of living alone. Where prices are high, independent living is more difficult relative to shared-living arrangements.

Higher nursing home use in a State is associated with more independent living. This finding confirms a relationship between living arrangement choice and the demand for institutional care, implying that in States with higher nursing home use, all else constant, individuals are more likely to choose institutional care over shared living arrangements when they find it difficult to maintain an independent household.

Conclusions

The analysis has used a cross-sectional data base that accounts for own income, disability, existence of children, and other factors to examine the correlates of independent living. First, the results imply that independence in living arrangement is what economists term a normal good. Older individuals are more likely to choose independent living as income rises, other things, including race, sex, and disability, being constant. Disability and the existence of adult children were, as expected, associated with a greater probability of living with others. However, the number of adult children did not effect living arrangement. This finding is of special interest: Observers have been concerned that the elderly of the next century will have fewer sources of assistance because lower current lifetime fertility will yield fewer adult children. Yet projections (Federal Council on the Aging, 1981) indicate that fewer of these elderly will have no living adult children, because of increased longevity of their offspring and a higher proportion of females bearing at least one child. Thus, recent fertility trends, although reducing the number of adult children, could even increase shared-living arrangements, holding income and other factors constant.

Females were found to be more likely than males to live with others at the mean level of income for females. In the aggregate, this is consistent with the conclusions of previous researchers that females are more likely to choose shared-living arrangements than males are. However, the current analysis has shown that increasing income has a larger positive effect on

females' propensity to live alone than on males', so that males and females with average characteristics for their gender and mean income for males have nearly equal probabilities of living alone. Rising real income for all elderly people could lead to a higher rate of independent living for females than for males, all else being equal.

Females who are not white were found to be much more likely to live with others at any level of income and disability, indicating that income differences are not entirely responsible for observed racial differences in living arrangements. Foreign-born males were less likely of live alone, but the expected cultural differences in living arrangement choice did not appear for females once disability and income were accounted for.

The interaction effect found for females between income and the disability measure associated with mobility suggests that increased income may lessen the impact of disability on the propensity to seek shared-living arrangements. Little is known about private demand for paid disability-related services; this finding suggests that higher income may be used to compensate for disability, perhaps through the purchase of services that support an independent lifestyle.

This study may be compared with other recent multivariate cross-sectional studies of living arrangements (Bachrach, 1980; Kobrin, 1981; Tissue and McCoy, 1981; and Soldo et al., 1981.) Bachrach (1980) focused on the effect of childlessness on the probability of living alone, but she was not able to include income, and she found no significant health effect. Kobrin (1981) used ordinary least-square regression to explain living away from relatives for all unmarried individuals 25 years of age or over on the basis of income, age, sex, and marital status, but not on race or disability. Tissue and McCoy (1981) focused on short-term changes in living arrangement, using 1-year changes in income, disability, and other factors, so that their predictions may not be valid for long-run permanent income changes. Soldo et al. (1981) studied elderly white females only to explain household headship, a dependent variable with different policy implications from the living arrangement dependent variable used here.

Policy implications

If the real incomes of elderly people continue to rise, the analysis suggests that more individuals will choose to live independently, rather than with others, other things being constant. Paradoxically, this could lead to a decline in certain measures of well-being for the elderly, including household income and unmet need for personal health and social support services. As with other lower income groups, the undoubling of elderly households permitted by income gains may increase the number of households and persons living below poverty income levels.

Increasingly, public programs are attempting to target home care resources to disabled community-resident elderly who would otherwise be cared for in nursing homes. Researchers studying the probability of institutionalization for disabled elderly have identified living alone as an important factor increasing the use of nursing home care (Greenberg and Ginn, 1979; Branch and Jette, 1982; Capitman, 1985). The results presented here indicate that higher income, white, native-born elderly are more likely to live alone. It would indeed be paradoxical if public home care resources were differentially directed toward these relatively advantaged individuals.

If rising real incomes lead to increased independent living by the elderly, this may increase demand for institutional long-term care, other things being equal. Those whose income enables them to live alone may be more prone to seek institutional care when they become disabled, other things being constant, because in-home support is not in place for them. But higher income may instead defer the shared-living choice rather than omitting it from the living-arrangement continuum. This cannot be investigated using cross-sectional data restricted to the noninstitutionalized elderly. Longitudinal multivariate studies of the determinants of transitions from marriage and other living arrangements to either shared or independent living, and to institutionalization, could better define the changing roles of income, disability, and family support in these transitions and clarify their significance for future long-term care needs.

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References

- Amemiya, T.: Qualitative response models: A survey. *J Econ Literature* 19(4):1483-1536, 1981.
- Bachrach, C. A.: Childlessness and social isolation among the elderly. *Journal of Marriage and the Family*, 42(3):627-637, 1980.
- Barron, E.: Survey design, estimation, procedures, and sampling variability. *Survey of Low Income Aged and Disabled*. Report No. 5. HEW Pub. No. (SSA) 79-11723. Social Security Administration. Washington. U.S. Government Printing Office, 1979.
- Beresford, J., and Rivlin, A.: Privacy, poverty and old age. *Demography*, 3(1):247-258, 1966.
- Belcher, J. C.: The one-person household: A consequence of the isolated nuclear family? *Journal of Marriage and the Family*, 29:534-540, Aug. 1967.

- Branch, L. G., and Jette, A. M.: A prospective study of long-term care institutionalization among the aged. *Am J Public Health* 72(12):1373-1379, Dec. 1982.
- Capitman, J. A.: Determinants of Institutionalization Among Participants in a Nursing Home Pre-Admission Screening Program. Virginia Center on Aging, Medical College of Virginia, Virginia Commonwealth University, 1985.
- Chevan, A., and Korson, J. H.: The widowed who live alone: An examination of social and demographic factors *Social Forces*, 51(1):45-53, Sept. 1972.
- Federal Council on the Aging: *The Need for Long-Term Care*. DHHS Pub No. (OHDS) 81-20704. Office of Human Development Services, Department of Health and Human Services. Washington. U.S. Government Printing Office, 1981.
- Fries, J. F.: Aging, natural death and the compression of morbidity. *N Engl J Med* 303(3):130-135, July 1980.
- Greenberg, J., and Ginn, A.: A multivariate analysis of the predictors of long-term care placement. *Home Health Services Quarterly* 1(1):75-79, Spring 1979.
- Kobrin, F. E.: Family extension and the elderly: Economic, demographic and family cycle factors. *J Gerontol* 36(3):370-377, 1981.
- Kobrin, F. E.: The primary individual and the family: Changes in living arrangements in the United States since 1940. *Journal of Marriage and the Family* 38(2):233-239, 1976.
- Lopata, H.: *Widowhood in an American City*. Cambridge. Schenkman, 1971.
- Manton, K. G.: Changing concepts of morbidity and mortality in the elderly population. *Milbank Mem Fund Q* 60(2):183-244, Spring 1982.
- Michael, R. T., Fuchs, V. R., and Scott, S. R.: Changes in the propensity to live alone: 1950-1976. *Demography*, (17)1:39-56, 1980.
- Oppenheimer, V. K.: The changing nature of life-cycle squeezes: Implications for the socioeconomic position of the elderly. *Aging: Stability and Change in the Family*. New York. Academic Press, 1981.
- Pampel, F. C.: Changes in the propensity to live alone: Evidence from consecutive cross-sectional surveys, 1960-1976. *Demography* 20(4):433-447, 1983.
- Robinson, B., and Thurnher, M.: Taking care of aged parents: A family cycle transition. *Gerontologist*, 19(6):586-593, 1977.
- Schorr, A.: "Thy Father and Thy Mother. . ." *A Second Look at Filial Responsibility and Family Policy*. SSA Pub. No. 13-11953. Social Security Administration. Washington. U.S. Government Printing Office, 1980.
- Schwartz, S., Danziger, S., and Smolensky, E.: The choice of living arrangement by the elderly. *Retirement and Economic Behavior*. Washington. Brookings Institution, 1984.
- Siegel, S.: Demographic aspects of aging and the older population in the United States. *Current Population Reports*, Special Studies Series P-23, No. 59. U.S. Bureau of the Census. Washington. U.S. Government Printing Office, 1978.
- Shanas, E.: The family as a social support system in old age. *Gerontologist* 19(2):169-174, 1979.
- Shanas, E., and Sussman, M.: The family in later life: Social structure and social policy. *Aging: Stability and Change in the Family*. New York. Academic Press, 1981.
- Soldo, B., and Lauriat, P.: Living arrangements among the elderly in the United States: A log linear approach. *Journal of Comparative Family Studies* 7(2):351-366, 1976.
- Soldo, B. J., Sharma, M., and Campbell, R. T.: *The effects of functional health status and demographic characteristics on the living arrangements of older unmarried women*. Washington. Center for Population Research, Georgetown University, 1981.
- Tissue, T., and McCoy, J. L.: Income and living arrangements among poor aged singles. *Soc Secur Bull*. 44(4) 3-13, Apr. 1981.
- Troll, L. E.: The family of later life: A decade review. *Journal of Marriage and the Family* 33(2):263-290, May 1971.
- U.S. Bureau of the Census: Money income in 1973 of families and persons in the United States. *Current Population Reports*. Series P-60, No. 97. Washington. U.S. Government Printing Office, 1976.
- Wolf, D. A.: Kin availability and the living arrangements of older women. *Social Science Research* 13(1):72-89, 1984.