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Effects of Neighborhood and Individual Change on the Personal Outcomes of Recent Movers to Low-Income Senior Housing

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The objective of this study was to determine the effects of neighborhood and individual change on the personal outcomes of recent movers to Canadian government-subsidized senior citizen apartment buildings (SCAs). The authors' sample included 137 recent movers to 25 SCA projects in Winnipeg, Manitoba, who participated in a longitudinal survey. The analysis involved testing four logistic and ordinary least squares regression models, with personal state outcomes of the moves (self-rated health, morale, depression, self-esteem) treated as dependent variables. Although the overall performance of the models was moderate, the entry of a block of independent change variables into the regression equations consistently registered statistically significant increases in their explanatory power. Significant predictors of the outcomes included changes in personal resources, everyday travel, and resident appraisals of service, social, and physical components of neighborhood content. The findings suggested that the older person's subjective interpretations of a new residential setting assumed more importance in producing outcomes than objective measures of that settings.

Keywords: *senior citizen apartments; relocation; environmental change; residential adjustment*

The development of appropriate housing alternatives for seniors requires a greater understanding of the adjustments of older people who move to more supportive residential facilities. In the present study, we investigated the role of neighborhood and individual factors in the residential adjustment of recent movers to a distinctive North American submarket of

age-segregated congregate housing facilities: Canadian government-subsidized senior citizen apartment buildings (SCAs). This senior housing submarket is expressly geared to accommodate low-income seniors prior to potential institutionalization. Although our attention is explicitly focused on Canadian senior housing, the findings of this study have wider relevance for researchers and policy makers concerned with all categories of senior housing in North America.

Tenants of SCAs may be either directly subsidized or required to pay rents related to reasonable proportions of their incomes (Brink 1995). A range of on-site services is offered at SCAs, including social activities and congregate meal programs, in addition to support services provided by the provincial homecare program and public health nurses. As a result of limitations in the selection of on-site services at SCAs, however, residents must often rely heavily on the use of amenities and social supports in the local neighborhoods to meet many of their needs. A move from housing in the community to an SCA typically involves relocating to a totally different residential environment, often requiring considerable adjustment on the part of the mover. Past work indicates that a move to an SCA may be precipitated by a number of factors, including decreases in financial resources, widowhood, declining health, and the limited availability of informal caregiving networks (Leung 1992; Smith and Gauthier 1995). Consequently, residents of SCAs are normally composed of relatively high proportions of single persons, women, low-income tenants, former renters, and users of public transportation (Leung 1992; Smith 1991). Although residents of SCAs are usually ambulatory and required to live independently, they are often mobility constrained because of declining competency and reduced access to automobile transportation. Thus, movers to SCAs are a segment of the elderly likely to be particularly vulnerable to potential stressors associated with residential change. However, relatively little is known about the

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outcomes of moves to SCAs and the factors that influence adjustment in the new residential setting.

Several researchers have drawn attention to the potentially positive outcomes associated with moves to age-segregated housing due to increased opportunities afforded for social interaction and the development of mutual support networks (Davidson, Brooke, and Kendig 2001; Sheehan 1986). However, the changes in person-environment relationships of SCA newcomers are extremely complex, involving the interplay of a wide variety of dynamic environmental, behavioral, and personal factors. Kendig (2003) noted that past work in the multidisciplinary subfield of environmental gerontology has tended to focus on the in-building environments of specialized residential settings rather than "the macro-scale environments of neighborhoods, regions, and urban-rural divides that are so significant in structuring experiences of aging" (p. 612). Golant (1992) similarly argued for a wider perspective of *place of residence* to be adopted to expand our understanding of the housing needs of seniors. In somewhat broader terms, there has been increasing interest among environmental gerontologists in treating "place" as an integrative construct for contextualizing person-environment interactions (Rowles and Watkins 2003; Weisman, Chaudhury, and Moore 2000). In addition, Golant (2005) emphasized the need to focus on individual-level variables that reflect actual interactive processes between an older person and the macro-scale residential context.

Geographical proximity to out-of-home services, amenities, and social ties may assume particular importance for older people subject to mobility restrictions, such as SCA residents. Both physical (e.g., traffic safety, highway conditions) and service (e.g., health facilities, shopping opportunities, personal business services) components of the local neighborhood environment have been found to contribute to the psychological well-being of the urban elderly (Burby and Rohe 1990; La Gory, Ward, and Sherman 1985; Lawton 1980; Smith and Gauthier 1995). In relation to the social content of the local neighborhood environment, there is considerable evidence that older adults often move to enjoy greater proximity to adult children and other relatives who may serve as major providers of instrumental and emotional supports (Koenig and Cunningham 2001; Silverstein and Angelelli 1998). Although some older people may be attracted to senior housing by a desire not to be a burden on younger relatives (Connidis 1983), the informal supports provided by proximate intergenerational caregivers may not only reduce the social isolation of residents in age-segregated housing projects (Stephens and Bernstein 1984) but also be critical in preventing nursing home placements (Bothell, Fischer, and Hayashida 1999).

Many of an older person's transactions with the local neighborhood environment typically involve everyday routine travel activities outside the place of residence. Past work has demonstrated that these activities are influenced by a variety of factors, including transport availability, geographic proximity to environmental opportunities, and the sociodemographic characteristics and physical capability of the elder (Cutler and Coward 1992; Smith 1991; Wacker, Roberto, and Piper 1998). In particular, the negative impact of the interaction between the declining competency of an older person and the constraints afforded by the local environment may ultimately result in diminishing the life space of that person (Rowles 1986).

In the present study, we formulated and tested regression models to address the following research question: "Do changes in local environmental content, personal resources, and everyday travel behavior influence the personal outcomes of recent movers to SCAs?" Although most investigations of the relationship between neighborhood context and elderly well-being have adopted cross-sectional and aggregate approaches, typically involving proxy variables (Diez Roux 2001; Subramanian et al. 2006), the present study offers an innovative perspective that focuses on an aging individual's experiences and outcomes in a changed neighborhood environment. A longitudinal survey design was used, enabling change to be evaluated by comparing attributes of the neighborhood and individual at the previously occupied residential setting with the same attributes at the new SCA setting. This temporal perspective is more amenable to an analysis of the determinants of the consequences of elderly residential change than the conventional cross-sectional methodological approach (Golant 1998).

The Conceptual Framework

The guiding conceptual framework of the study was an amended version of Golant's (1998) model of the outcomes of older adults following residential adjustments. A major advantage of Golant's model over the earlier ecological models of environment-behavior relationships (Lawton and Nahemow 1973; Parmelee and Lawton 1990) is that it provides an explicit temporal perspective on changes in residential or care settings. A further strength of Golant's model is its recognition that different individuals have experienced different trajectories of environmental and individual change over time which influence their outcomes in changed settings. Moreover, Golant (1998:40) argued that his model has particular relevance for vulnerable older people moving into congregate housing.

In broad terms, Golant's (1998) model adopts an "interactional worldview," proposing that positive or negative outcomes in housing arrangements are ultimately influenced by sets of personal and behavior-setting components. Although the model was designed to be operationalized using longitudinal survey data, Golant acknowledged that "the researcher seeking to measure its constructs and establish causal relationships for its antecedents faces some formidable challenges" (p. 56). Therefore, to facilitate empirical testing, a simplified version of the original model was used in the present study, including constructs and relationships deemed to be of importance in the residential adjustment of movers to government-subsidized senior housing. In particular, we modified some of Golant's constructs relating to broader aspects of residential change to permit the inclusion of more focused constructs concerning change in specific components of a mover's local out-of-home neighborhood environment and everyday behavior.

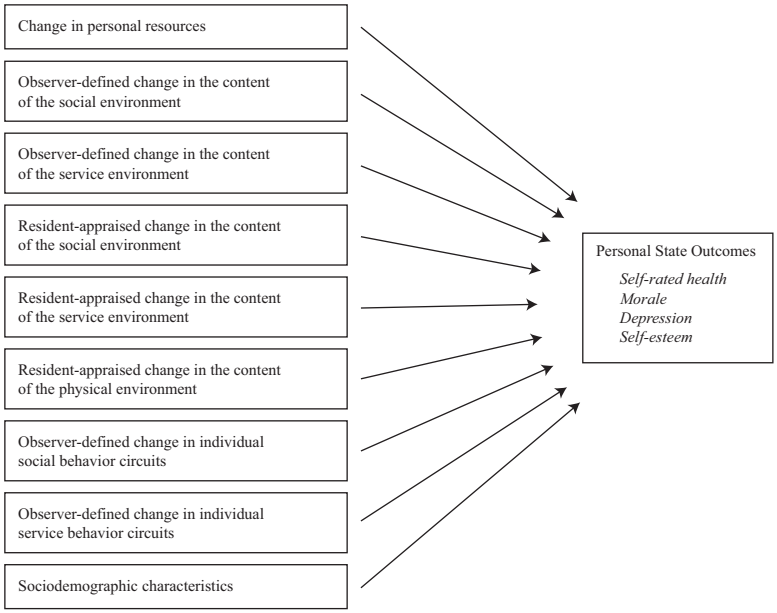
Our conceptual framework (Figure 1) explicitly proposes relationships between a set of nine antecedent environmental and individual constructs and four personal state outcomes of movers to SCAs. Each of the personal state outcomes concerns attitudes of individuals toward their self or life circumstances and experiences. Although self-rated health is a general measure of psychophysical symptoms, morale, depression, and self-esteem are each indicators of intrapsychic well-being. In addition, self-esteem is considered to be a coping resource that assumes an important role as an indicator of adaptation in a new residential setting (van Baarsen 2002).

Eight of the nine antecedent constructs relate to changes in environmental content, behavior circuits, and personal resources that are associated with the move from the previously occupied residential setting to the SCA setting. The five *environmental content* constructs concern change in the physical, social, and service components of the behavior setting afforded by the local out-of-home neighborhood milieu. This behavior setting represents part of what Golant (1998) termed the *functionally relevant environment*, which comprises

> those objects and activities in a setting that have the potential of evoking, reinforcing, or modifying an individual's or population's behaviors and experiences and that present both opportunities and constraints to residents seeking to satisfy their needs, goals, and preferences. (p. 42)

The inclusion of subjectively defined (resident-appraised) dimensions of environmental change together with "objective" (observer-defined) change in the model was justified by Golant on the grounds that "the outcomes experienced by older persons in their new settings are as much a product

Figure 1
The Conceptual Framework: Antecedents of the Personal State Outcomes of Movers to Government-Subsidized Senior Housing



of their perceived life situation as they are of their setting's objective conditions" (p. 38).

Behavior circuits are behaviors that people routinely engage in to sustain their physical requirements and satisfy their needs for social interaction. To more fully understand the personal state outcomes of a residential relocation to an SCA, it is desirable to focus on change in specific aspects of everyday behaviors that are likely to have particular instrumental, symbolic, or emotional significance for an older mover. Accordingly, the two observer-defined antecedent constructs in the conceptual framework concerning behavior circuits specifically related to change in key social and service resources in the local behavior setting of the SCA.

The final antecedent change construct concerned *personal resources* that enable an older person to function without assistance in terms of "biological health, sensation and perception, motor behavior, and cognition" (Lawton

1983:350). We thus decided to treat objectively defined personal resources such as behavioral competence and physical health conditions as change variables rather than stable attributes in the model. The rationale for our decision was that significant changes in the functional capabilities of at least some older people may take place within a relatively short time period. These changes will likely influence the nature of an older person's environmental interactions and the ultimate outcomes of the residential move. In addition to the change components, however, the conceptual framework does include an antecedent construct composed of relatively stable attributes to control for the diverse *sociodemographic characteristics* of older movers. Nonetheless, it should be noted that there are complex interrelationships among all of the antecedent constructs even though they are not specified in the model.

Design and Methods

Survey Design and Data Collection

In Winnipeg, there are two major categories of government-subsidized SCAs: public housing owned by the Manitoba Housing Authority and nonprofit housing. During the study period, there were 98 government-subsidized SCA projects in the city (Age and Opportunity 2006). Our survey was based on a convenience sample of these projects selected on the basis of two criteria. First, smaller SCAs were excluded from the sample to ensure that all of the selected projects included at least some recent movers. Second, to afford significant variations in the physical and service characteristics of local neighborhood environments, approximately equal numbers of projects were selected from two major geographical areas of the city of Winnipeg: the "inner city" and the "suburbs." The inner city of Winnipeg is a contiguous area that is distinguished from the remainder of the city (i.e., the suburbs) on the basis of criteria relating to its older building stock (Ley 1991; Smith, Sylvestre, and Ramsay 2002). Included in the inner city are several densely populated "service-rich neighborhoods," together with the city's main concentration of retail outlets located in the downtown area. In contrast, suburban SCA projects are usually located in lower density neighborhoods, often with fewer proximate service resources. Although recent years have witnessed increases in the provision of service facilities in some suburban areas, these resources are typically concentrated in planned shopping malls and "big box" stores that are not located within easy walking distance

of SCA projects. Thus, a purposive sample of SCAs was selected to comprise a reasonable balance of projects from the inner city (13 projects) and the suburbs (12 projects). Taken together, the 25 sample projects accounted for 32.6% (2,971 units) of the total number of government-subsidized SCA units in Winnipeg, with sizes ranging from 80 to 210 units.

The data sources of this study related to a longitudinal sample of older residents who participated in two waves on the basis of interview surveys (surveys 1 and 2). The survey 1 wave focused on recent movers to SCAs from conventional housing in the community. Eligible residents for inclusion in survey 1 were required to be (1) aged 55 years and older, (2) fully retired, and (3) domiciled at an SCA for a minimum of 1 month and a maximum of 1 year. In relation to the present study, the relevant parts of the survey 1 questionnaire included a series of structured questions concerning the personal characteristics and resources, travel behaviors, and local environmental settings of respondents at the residence occupied immediately prior to the move (time 1). The second wave was based on a follow-up survey (survey 2) of survey 1 respondents conducted one year later (time 2). Thus, all respondents completing survey 2 had lived at the SCAs for a period of 13 to 24 months. Although the survey 2 questionnaire included structured questions similar to those in the survey 1 instrument, they specifically related to the current attributes of the individual and the local neighborhood setting of the SCA. In addition, the survey 2 questionnaire elicited data concerning the current personal state outcomes of the residents.

A convenience sampling procedure was used to select SCA residents for inclusion in the interview survey. Initially, project managers at each of the selected 25 SCAs prepared listings of households that included at least one resident who was deemed to satisfy the eligibility criteria for inclusion in survey 1. In-person interviews were conducted by a team of three trained interviewers and were approximately one hour in length. From the listings of 415 households, a total of 230 residents completed the survey 1 questionnaire, representing a response rate of 55.4%. Nonresponses were due to the inability of interviewers to contact listed residents (18.7% of potential respondents), the inadvertent inclusion of ineligible residents in the listings (12.2%), refusals (10.4%), and the inability of residents to complete the interview because of ill health or language difficulties (3.2%). The survey 2 interviews were of a similar length and conducted by the same interviewing team. In view of the typically mobile nature of SCA residents, a relatively high rate of attrition of survey 1 respondents was largely unavoidable. Specifically, no fewer than 54 (23.5%) of the survey 1 residents had moved from their SCA projects and were thus not reinterviewed, while a

further 9 (3.9%) were deceased. A total of 137 of the 167 remaining survey 1 respondents who still resided at the SCAs fully completed the survey 2 interviews, representing a response rate of 82.0%. Nonresponses in survey 2 were due to the unavailability of residents (5.4% of survey 1 participants), ill health (7.8%), and refusals (4.8%). The results of bivariate statistical tests revealed that there were no significant differences at the .05 level between the sociodemographic characteristics (age, education, gender, income adequacy, and marital status) and personal resources (chronic conditions, activity of daily living [ADL] limitations, and instrumental ADL [IADL] limitations at time 1) of survey 1 respondents lost through attrition ($n = 93$) and survey 2 respondents ($n = 137$). However, it is noteworthy that survey 1 respondents lost through attrition also registered significantly shorter residencies at their previous dwellings ($\chi^2 = 9.81$, $df = 8$, $p < .05$), thus indicating that this group was composed of particularly mobile seniors.

Measures of Personal State Outcomes

To elicit data on the personal state outcomes at time 2, which were treated as dependent variables in the regression analyses, response formats on the basis of the following measures were included in the survey 2 questionnaire.

Self-rated health. Self-rated health was assessed on the basis of responses to a global question concerning health status (Liang 1986). Specifically, respondents were asked to rate their health on a five-point scale ranging from bad to excellent. These responses were then dichotomized and coded so that 0 = bad, poor, or fair health and 1 = good or excellent health.

Morale. The morale of respondents was evaluated in terms of data elicited by a shortened version of the Philadelphia Geriatric Center(PGC) Morale Scale (Lawton 1975), a multidimensional measure of the subjective well-being of older adults (Cronbach's $\alpha = .75$). The scale includes 14 items related to agitation, attitude toward aging, and lonely dissatisfaction with responses based on a yes-or-no format. The scores on the scale range between 0 (low morale) and 14 (high morale).

Depression. Depressive symptoms were assessed using the Center for Epidemiological Studies Depression Scale (CES-D) developed by Radloff (1977) to identify depression in the general population (Cronbach's $\alpha = .85$). To indicate the frequency of occurrence of 20 depressive symptoms in the past week, the scale includes 20 items with a four-point response format ranging from rarely or none of the time (0 points) to most of the time

(3 points). On the basis of the addition of these points, the scores on the CES-D can range from 0 (low depression) to 60 (high depression).

Self-esteem. The Bachman's (1970) revision of Rosenberg's (1965) Self-Esteem Scale was used as a unidimensional measure of global self-esteem (Cronbach's $\alpha = .75$). The scale consists of 10 items with a yes-or-no format. The scores on the scale range from 0 (low self-esteem) to 10 (high self-esteem).

Antecedent Construct Change Variables and Sociodemographic Variables

A total of 29 change variables that constituted the eight antecedent change constructs were initially considered for inclusion as independent variables in the regression analyses (Table 1). The selection of these variables was informed by (1) guidelines outlined by Golant (1998) for the operationalization of his model of the residential adjustment outcomes of older people and (2) the need to include variables of particular relevance for the relatively vulnerable and mobility-constrained segment of the elderly that was the focus of the present study. For each variable, change was measured by residualizing each score at time 2 by the baseline score at time 1. If the variable was measured using continuous data, change was evaluated in terms of one change score. (It should be noted that all variables concerning change in distance were measured in terms of data relating to the lengths of the most direct street or highway routes between points.) If the variable was measured using categorical data, change was assessed in relation to categories representing increase, decrease, and either one or two levels of stability (Table 1). To incorporate these change categories into the regression analysis, dummy variables were created and coded on the basis of two values assigned to respondents: 1 = membership in specified change category, and 0 = membership in any other category. The number of dummy variables required for the regression analysis is the number of categories constituting the original variable minus one (Robinson 1998). Accordingly, the category representing the most positive outcome was omitted from the regression analysis and treated as the reference category (Table 1). Thus, coefficients computed for the dummy variables represent the effect of each category compared with the reference category. For each of the change variables in Table 1, the measurement and coding procedures are conveniently summarized within an organizational framework composed of four sets of antecedent constructs.

Table 1
Antecedent Change Constructs and Variables

Antecedent Change Construct	Antecedent Change Variable	Change Unit/Category
Observer-defined change in the content of the social environment	Proximity to closest family member[a]/friend	Change in distance (km)
	Number of friends	Change in number
Observer-defined change in the content of the service environment	Proximity to closest bus stop	Change in walking time (minutes)
	Proximity to closest shopping center	Change in distance (km)
	Proximity to closest grocery store	Change in distance (km)
Resident-appraised change in the content of the social environment	Satisfaction with proximity to family[a]	(1) Stable, nonsatisfaction
	Satisfaction with proximity to friends	(2) Decreased satisfaction
	Satisfaction with security from crime	(3) Stable, satisfaction
		(4) Improved satisfaction[b]
Resident-appraised change in the content of the service environment	Satisfaction with proximity to grocery stores	(1) Stable, nonsatisfaction
	Satisfaction with proximity to pharmacies	(2) Decreased satisfaction
	Satisfaction with proximity to banks	(3) Stable, satisfaction
	Satisfaction with proximity to physician's office	(4) Improved satisfaction[b]
	Satisfaction with global proximity to services	
Resident-appraised change in the content of the physical environment	Satisfaction with sidewalk conditions	(1) Stable, nonsatisfaction
	Satisfaction with traffic safety	(2) Decreased satisfaction
	Satisfaction with snow removal	(3) Stable, satisfaction
		(4) Improved satisfaction[b]
Observer-defined change in individual social behavior circuits	Number of visits to family[a] and friends	Change in number of visits
	Distance to most frequently visited family member[a]	Change in distance (km)
	Use of automobile to visit family[a]	(1) Stable, no auto transport
	Use of automobile to visit friends	(2) Decreased auto transport

(*continued*)

Table 1 (continued)

Antecedent Change Construct	Antecedent Change Variable	Change Unit/Category
		(3) Stable, auto transport
		(4) Increased auto transport[b]
Observer-defined change in individual service behavior circuits	Number of visits to services	Change in number of visits
	Total travel distance to service sites	Change in distance (km)
	Use of automobile to travel to grocery store	(1) Stable, no auto transport
	Use of automobile to travel to pharmacy	(2) Decreased auto transport
	Use of automobile to travel to bank	(3) Stable, auto transport
	Use of automobile to travel to physician's office	(4) Increased auto transport[b]
Change in personal resources	Activities of daily living (ADLs)	(1) Increase in ADL limitations
		(2) Stable ADL limitations
		(3) Decrease in ADL limitations[b]
	Instrumental ADLs (IADLs)	(1) Increase in IADL limitations
		(2) Stable IADL limitations
		(3) Decrease in IADL limitations[b]
	Chronic conditions	(1) Increase in conditions
		(2) Stable conditions
		(3) Decrease in conditions[b]

a. "Family" or "family member" includes any relative identified by the respondent.
b. Reference dummy variable not included in regression models.

Observer-defined change in environmental content. Five change variables constituted the two antecedent change constructs concerning social and service components of observer-defined environmental content. Of these variables, change in proximity to closest family member or friend, closest shopping center, and closest grocery store were each measured in

kilometers on the basis of differences in their distance separation from the place of residence before and after the move. Change in proximity to the closest bus stop was measured in terms of change in walking time (in minutes) from the place of residence, while change in the number of friends was measured on the basis of the difference in the number of people identified as friends by the respondents.

Resident-appraised change in environmental content. Resident-appraised change in environmental content was evaluated in terms of 11 variables constituting three antecedent change constructs concerning physical, social, and service components of the local neighborhood environment. For each variable, the data are based on respondent satisfaction ratings of environmental characteristics on five-point or seven-point scales (with scores ranging from 1 = very dissatisfied to 5 or 7 = very satisfied). The scores on each of these scales were weighted in terms of respondents' assessments of the importance or "salience" of the environmental characteristics represented. To measure change in relation to each of the resident-appraised variables, four dummy variables were coded dichotomously on the basis of the following categories: (1) stable, nonsatisfaction; (2) decreased satisfaction; (3) stable, satisfaction; and (4) improved satisfaction.

Observer-defined change in individual behavior circuits. Two observer-defined antecedent change constructs concerning individual social and service behavior circuits were composed of 10 change variables. Change in the number of visits to (1) family or friends and (2) services were each measured in terms of the difference in the annual number of visits before and after the move. Change in distance to the most frequently visited family member and change in the total distance to service sites were each measured in kilometers on the basis of change in distance separation from the place of residence. In relation to each of 6 variables concerning change in the use of automobiles to visit various social and service-related destinations, 4 dummy variables were coded dichotomously in terms of the following categories: (1) stable, no auto transport; (2) decreased auto transport; (3) stable, auto transport; and (4) increased auto transport.

Change in personal resources. Scores on each of Katz et al.'s (1963) Index of ADLs (based on 11 ADLs) and Lawton and Brody's (1969) IADL Scale (based on 8 tasks) were used to evaluate change in functional health limitations. The assessment of change in physical health status involved the use of a standardized measurement instrument that yielded a score based on

the number of 20 prespecified chronic conditions that the respondent had experienced within the past year. To measure change in each of ADL limitations, IADL limitations, and chronic conditions, three dummy variables were coded dichotomously in terms of the following categories: (1) increase in limitations/conditions, (2) stable limitations/conditions, and (3) decrease in limitations/conditions.

Sociodemographic characteristics. Four relatively stable sociodemographic characteristics of respondents at time 2 were treated as a control block of variables in all of the regression analyses (Table 2). Age (in years) was based on continuous data, while the other three control variables were categorical. Two of these variables were income adequacy (0 = income does not comfortably meet needs, 1 = income comfortably meets needs), and education level (1 = grade 6 or less, 2 = grades 7 to 12, 3 = college or university). The majority of women in the sample (87.1%) were classified as single and included those who had either never married or were widowed, separated, or divorced. In light of the relative vulnerability of older single women to problems concerning their access to health and material resources (Pinquart and Sorensen 2001), the third categorical control variable was formulated to distinguish single women from all other respondents (0 = single women, 1 = men and other women).

Analytic Procedure

Four separate regression models were formulated and tested with each of the personal state outcomes treated as a dependent variable. Model 1 was a logistic multiple regression model that predicted self-rated health coded as a dichotomous variable. Models 2 to 4 were ordinary least squares (OLS) multiple regression models that predicted morale, depression, and self-esteem measured using continuous data. Because there are formal limitations on the number of independent variables in both logistic and OLS multiple regression equations (Tabachnick and Fidell 2001), exploratory regression analyses were conducted to determine which of the large set of change variables would be most appropriately included as predictors in the final models. Specifically, four sets of 29 exploratory regression analyses were conducted, with each of the personal state outcomes treated as a dependent variable. For each of the four sets of exploratory regression analyses, two blocks of independent variables were entered into the equation: (1) the four sociodemographic control variables and (2) either one

Table 2
Sociodemographic Characteristics of Sample (time 2)

	% (*n*)		
Sociodemographic Characteristic	Men (*n* = 52)	Women (*n* = 85)	Total (*n* = 137)
Age (years)			
55 to 64	51.9 (27)	28.2 (24)	37.2 (51)
65 to 74	30.8 (16)	24.7 (21)	27.0 (37)
75 to 84	7.7 (4)	35.3 (30)	24.8 (34)
≥85	9.6 (5)	11.8 (10)	10.9 (15)
Marital status			
Never married	25.0 (13)	11.8 (10)	16.8 (23)
Married	3.8 (2)	12.9 (11)	9.5 (13)
Widowed	17.3 (9)	54.1 (46)	40.1 (55)
Divorced/separated	53.8 (28)	21.2 (18)	33.6 (46)
Education level			
No schooling	3.8 (2)	3.5 (3)	3.6 (5)
Grades 1 to 6	17.3 (9)	17.6 (15)	17.5 (24)
Grades 7 to 12	69.2 (36)	57.6 (49)	62.0 (85)
College nondegree	1.9 (1)	15.3 (13)	10.2 (14)
College degree	7.7 (4)	5.9 (5)	6.6 (9)
Income adequacy			
Very well	15.4 (8)	31.8 (27)	25.5 (35)
Fairly well	34.6 (18)	35.3 (30)	35.0 (48)
Just adequately	32.7 (17)	20.0 (17)	24.8 (34)
Some difficulty	13.5 (7)	11.8 (10)	12.4 (17)
Totally inadequate	3.8 (2)	1.2 (1)	2.2 (3)

change variable (measured using continuous data) or a set of dummy change variables (measured using categorical data).

On the basis of the results of the preliminary analyses, it was decided that the independent change variables to be included in the final analytic models would be (1) variables significant at the .05 level for model 1 and (2) variables significant at the .10 level for models 2 to 4. (The more conservative significance level used to select variables for inclusion in model 1 was necessary because the preliminary regression analysis revealed that a relatively large number of variables were significantly related to self-rated health.) All variables finally selected for inclusion in each of models 1 to 4 are presented in Tables 3 and 4. For each model, applying the method outlined by Chang and Sanna (2001) did not produce evidence of multicollinearity among the selected independent variables.

Table 3
Model 1 (self-rated health): Results of Logistic Regression Analysis ($n = 137$)

Independent Variables	β	*SE*	exp(β)	95% Confidence Limits for exp(β) Lower	Upper
Sociodemographic control variables					
Gender/marital status	0.048	0.479	1.049	0.411	2.682
Age	0.019	0.027	1.019	0.967	1.074
Income adequacy	–0.018	0.495	0.982	0.372	2.590
Education	0.524	0.367	1.688	0.822	3.468
Antecedent change variables					
IADLs 1	1.845	0.949	6.330	0.985	40.684
IADLs 2	3.236***	0.955	25.442	3.913	165.417
Chronic conditions 1	–0.445	0.495	0.641	0.243	1.690
Chronic conditions 2	2.543**	0.969	12.714	1.901	85.015
Satisfaction with proximity to family 1	–2.932*	1.299	0.053	0.004	0.680
Satisfaction with proximity to family 2	–0.925	0.667	0.397	0.107	1.466
Satisfaction with proximity to family 3	–0.608	0.541	0.545	0.189	1.573
Satisfaction with proximity to grocery stores 1	–0.057	1.594	0.944	0.042	21.461
Satisfaction with proximity to grocery stores 2	2.083**	0.741	8.029	1.881	34.276
Satisfaction with proximity to grocery stores 3	0.935	0.541	2.547	0.882	7.353
Use of auto transport to grocery stores 1	4.268**	1.514	71.352	3.670	1,387.295
Use of auto transport to grocery stores 2	3.745*	1.563	42.325	1.976	906.359
Use of auto transport to grocery stores 3	4.498**	1.609	89.876	3.840	2,103.558
Constant	–9.142	2.979	0.000		

–2 log likelihood = 131.142;
$R^2 = .348$;
increase in R^2 due to entry of antecedent change variables: .315 ($\chi^2 = 58.597$, $df = 17$, $p < .001$).

*$p < .05$. **$p < .01$. ***$p < .001$.

Results

The primary reasons cited by respondents for moving to SCAs were declining health, physical difficulties at their previous residences (relating mainly to the size, maintenance, and deterioration of the dwellings), and financial constraints. Table 2 indicates that approximately two thirds of the respondents at time 2 were younger than 75 years of age. This relatively young age profile reflects the fact that sample residents were limited to persons

Table 4
Models 2 to 4: Results of Ordinary Least Squares Regression Analyses ($n = 137$)

	Model 2: Morale			Model 3: Depression			Model 4: Self-Esteem		
Independent Variable	*B*	*SE*	β	*B*	*SE*	β	*B*	*SE*	β
Sociodemographic control variables									
Gender/marital status	0.619	0.643	0.081	–2.239	1.649	–0.114	–0.087	0.257	–0.028
Age	–0.017	0.033	–0.048	0.025	0.082	0.027	–0.016	0.013	–0.108
Income adequacy	1.068	0.686	0.138	–1.784	1.713	–0.090	0.362	0.271	0.114
Education	0.890	0.491	0.144^{+}	–1.857	1.232	–0.118	0.359	0.198	0.142^{+}
Antecedent change variables									
Chronic conditions 1	–0.778	0.669	–0.101	–	–	–	–0.007	0.266	0.002
Chronic conditions 2	1.204	0.837	0.125	–	–	–	0.712	0.333	0.179*
Satisfaction with security 1	–2.014	1.257	–0.132	4.307	3.236	0.110	–	–	–
Satisfaction with security 2	–2.194	0.843	–0.231**	8.215	2.175	0.337***	–	–	–
Satisfaction with security 3	–0.519	0.723	–0.064	1.173	1.885	0.057	–	–	–
Satisfaction with snow removal 1	–	–	–	–	–	–	0.799	1.450	0.044
Satisfaction with snow removal 2	–	–	–	–	–	–	–1.061	0.427	–0.225*
Satisfaction with snow removal 3	–	–	–	–	–	–	–0.206	0.277	–0.066
Satisfaction with proximity to family 1	–	–	–	1.325	3.718	0.030	–	–	–
Satisfaction with proximity to family 2	–	–	–	–2.909	2.323	–0.112	–	–	–
Satisfaction with proximity to family 3	–	–	–	–3.714	1.848	–0.190*	–	–	–
Satisfaction with global proximity to services 1	–5.532	1.903	–0.246**	16.504	4.767	0.287***	–3.267	0.745	0.353***
Satisfaction with global proximity to services 2	–0.808	0.985	–0.072	1.037	2.472	0.036	–0.252	0.401	0.055

(*continued*)

Table 4 (continued)

Independent Variable	Model 2: Morale			Model 3: Depression			Model 4: Self-Esteem		
	B	*SE*	β	*B*	*SE*	β	*B*	*SE*	β
Satisfaction with global proximity to services 3	–0.969	0.698	–0.128	3.308	1.757	0.171	–0.574	0.269	–0.184
Satisfaction with proximity to pharmacies 1	2.068	2.149	0.080	–4.330	5.465	–0.065	–	–	–
Satisfaction with proximity to pharmacies 2	0.287	0.965	0.027	2.537	2.510	0.093	–	–	–
Satisfaction with proximity to pharmacies 3	2.174	0.713	0.287**	–4.778	1.881	–0.247**	–	–	–
Satisfaction with proximity to physician 1	–	–	–	–	–	–	0.510	0.680	0.061
Satisfaction with proximity to physician 2	–	–	–	–	–	–	0.890	0.381	0.210*
Satisfaction with proximity to physician 3	–	–	–	–	–	–	0.753	0.285	0.242**
Constant		2.592			6.484			1.182	
Multiple R^2		.268			.303			.311	
Increase in R^2 due to entry of antecedent change variables		.197***			.258***			.215***	
Adjusted R^2		.178			.210			.226	

$^{+}p < .10$. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

who had only recently moved to SCAs from the community. More consistent with the typical sociodemographic profile of residents of low-income senior housing was the low proportion of men aged 75 years and older, together with the relatively high percentages of women and unmarried respondents. However, the sample included an unusually high proportion of men who were separated or divorced. Table 2 indicates that the majority of respondents had obtained a grade 7 to 12 education, while a relatively high proportion reported income levels that were at least "adequate." In addition to the data presented in Table 2, it is noteworthy that 77.4% of the sample had at least one child, while only 20.4% possessed a car.

It is also important to note differences among the sample at time 2 in terms of length of residence at the SCA given that the residency of respondents included in survey 1 ranged from 1 month to 1 year at time 1. For example, 65.0% of the sample had already lived in their SCAs for 7 to 12 months at time 1. However, the results of bivariate statistical tests disclosed no significant differences at the .05 level between the personal state outcomes of these "longer term" residents and residents with shorter tenancy.

Tests of Regression Models

For each of the regression models (Tables 3 and 4), the independent variables were entered into the equations as two blocks through a stepwise forward process, with the forced entry of the control block of four sociodemographic variables followed by the entry of the block of change variables. For each model, the entry of the block of antecedent change variables produced a significant increase in R^2 at the .05 level. The detailed results of the test of each model are outlined in turn.

Model 1: self-rated health. Model 1 included a block of 13 independent variables relating to four antecedent change constructs (Tables 1 and 3). The results of the logistic regression analysis (Table 3) disclose that the variables entered into model 1 were able to correctly classify 34.8% of cases ($\chi^2 = 58.60$, $df = 17$, $p < .001$). Seven of the change variables were statistically significant predictors of self-rated health at the .05 level. The two positive and statistically significant relationships registered by variables concerning change in personal resources indicate that the log odds of rating health as either excellent or good increased if the resident experienced stability in either the number of IADL limitations or the number of chronic conditions.

The three positive and significant relationships recorded by variables concerning observer-defined change in individual service behavior circuits

all related to the use of automobiles for travel to grocery outlets. These results consistently reveal that residents whose use of automobiles for food shopping purposes was stable or had decreased were more likely to rate their health positively compared with residents whose use of automobile transportation had increased. The results included in Table 3 also reveal that residents expressing decreased satisfaction with proximity to grocery stores were more likely to rate their health positively. Taken together, these findings concerning grocery shopping somewhat surprisingly disclose that positive health outcomes were more likely to be associated with residents whose ability to access out-of-home food resources did not improve after the move. On the other hand, continued dissatisfaction with access to family members reduced the likelihood of positive self-ratings of health.

Model 2: morale. Model 2 included a block of 11 independent variables that related to four antecedent change constructs (Tables 1 and 4). The results of the OLS multiple regression reveal that model 2 accounted for 18% of the explanation of morale (Table 4). The three change variables that were significant predictors of morale at the .05 level each related to residents' appraisals of environmental change. First, the negative and statistically significant standardized regression coefficient for satisfaction with security 2 indicates that respondents were more likely to have lower morale if perceived security declined after the move. Second, the positive and statistically significant relationship between morale and satisfaction with proximity to pharmacy 3 is indicative of higher morale among residents who remained satisfied after the move. The third statistically significant standardized regression coefficient, which is recorded for change in global proximity to services 1, is negative, thus indicating that lower morale was associated with continued dissatisfaction with overall service provision. Of the block of control variables, education was a positive and marginally significant ($p < .10$) predictor of morale.

Model 3: depression. Model 3 included a block of 12 independent variables relating to three antecedent change constructs (Tables 1 and 4). The results of the OLS multiple regression disclose that model 3 provided 21% of the explanation of depression (Table 4). Of the four statistically significant predictors of depression at the .05 level, three were concerned with resident appraisals of change in the content of either the service environment or the physical environment, and the other was related to the social environment. Specifically, the positive and significant relationship recorded by satisfaction with global proximity to services 1 implies that older persons

who were dissatisfied with overall proximity to services at both the past residence and the SCA were more likely to report greater depression. In addition, respondents who remained satisfied with their proximity to each of pharmacies and family members after the move reported significantly lower levels of depression, while higher levels of depression were significantly related to perceived declines in security from crime.

Model 4: self-esteem. The block of 11 independent change variables included in model 4 related to three antecedent change constructs (Tables 1 and 4). Table 4 discloses that the OLS multiple regression provided 23% of the overall explanation of self-esteem. Table 4 also reveals that 6 of the 11 independent change variables that entered the model predicted self-esteem at the .05 level of significance. Four of these variables concerned residents' appraisals of change in the content of either the service environment or the physical environment. The negative and statistically significant standardized regression coefficient of satisfaction with global proximity to services 1 indicates that older persons who remained dissatisfied with proximity to services after the move were more likely to report lower self-esteem. The statistically significant relationships registered by two of the dummy variables concerning satisfaction with proximity to physician's office somewhat surprisingly disclose that decreased or stable levels of satisfaction were associated with higher levels of self-esteem. However, lower levels of self-esteem were significantly related to decreased satisfaction with snow removal after the move. Respondents who maintained a stable number of chronic conditions also reported significantly higher levels of self-esteem. Finally, the positive and marginally significant ($p < .10$) relationship registered by the education control variable suggests that greater self-esteem was more likely among movers with higher levels of socioeconomic status.

Discussion

In this study, we used a longitudinal survey design to address our research question concerning the effect of changes in local neighborhood settings, personal resources, and routine local travel on the outcomes of recent movers to Canadian government-subsidized senior housing in an urban housing market. Overall, the results of the tests of the regression models disclose that the change variables provided only relatively moderate levels of explanation of the variation of the four personal state outcomes. For all of the models, however, it is notable that the entry of the block of change variables into the

regression equation consistently registered a significant increase in the explanatory level after the effects of the sociodemographic control variables were taken into account. In general terms, therefore, these results reveal that key changes in the residential setting, individual resources, and behaviors of a mover do ultimately contribute to his or her residential adjustment.

It is noteworthy that the results disclose change variables constituting five of the antecedent change constructs to be significant predictors of at least one of the personal state outcomes. Three of these constructs concern resident appraisals of change in various aspects of the local service, social, and physical environment. In contrast, none of the change variables related to either of the observer-defined environmental content constructs qualified for inclusion in the regression models. It is particularly notable that variables concerning "satisfaction with proximity" were found to have greater predictive capability than those involving physical measures of distance separation. Thus, these findings broadly support the contention that the older person's subjective interpretations of a new setting may assume more importance producing outcomes than objective measures of the setting (Golant 1998).

Of the "resident appraisal variables," it is notable that stable (i.e., "continued") nonsatisfaction with global proximity to services was a significant predictor of no fewer than three negative personal state outcomes (models 2 to 4). In addition, continued satisfaction with proximity to pharmacies (models 2 and 3) and continued or decreased satisfaction with proximity to a physician (model 4) were predictors of positive personal state outcomes. Taken together, these results are consistent with the findings of past work highlighting the importance of neighborhood service provision for the elderly (e.g., Smith et al. 2002) and underscore the need for senior housing to be located in "service-rich" environments. Moreover, the disclosed predictive power of variables concerning continued levels of satisfaction or nonsatisfaction with the service environment (models 2 to 4) and the social environment (models 1 and 3) support the proposition that previous residential experiences have a major impact on the adjustment of the older person in a new shelter setting (Golant 1998). However, the results also suggest that successful adjustment may ultimately be hampered by increased concern regarding security from crime (models 2 and 3).

Caution must necessarily be exercised in the interpretation of the results concerning change in personal resources, because the changes recorded during the relatively short study period were generally modest. Nonetheless, the results of the tests of models 1 and 4 suggest that more positive outcomes were related to stability in functional ability (on the basis of IADL limitations) or physical health (on the basis of chronic conditions). In relation to

functional ability, it is interesting to note that those residents who first received instrumental supports such as meal preparation and house cleaning at the SCAs were more likely to experience negative outcomes. The same residents were also more likely to experience difficulties in accessing amenities in the local neighborhood environments of the SCAs. With regard to residential adjustment over a longer time period, the results of the present study suggest that change in personal resources may not only be an important determinant of the local moves of older people but also of the outcomes of these moves. Furthermore, it should be noted that the marginal significance of education in models 2 and 4 suggests that older movers with a lower socioeconomic status were also more likely to experience negative outcomes. Overall, these results highlight the need for interventions at SCAs specifically to target "at-risk" newcomers who have moved primarily because of diminished functional capabilities, limited financial resources, and declines in physical health.

With regard to variables concerning observer-defined change in individual service behavior circuits, only model I registered significant relationships. Somewhat surprisingly, residents whose use of automobiles (usually as passengers) for grocery shopping purposes did not increase after the move to SCAs were typically those who indicated that they enjoyed better health. However, these healthier residents were often able to travel to grocery stores without assistance by bus or on foot. Moreover, this result would appear to be consistent with the disclosed significance of decreased satisfaction with proximity to grocery stores in model 1, which implies that residents in better health were able to overcome perceived decrements in local food shopping opportunities due to the move. In broader terms, these findings highlight the need for future work to extend theoretical perspectives in order to further clarify the interrelatedness of the behavior circuits of older people and local environmental content.

Overall, the moderate explanatory power of the regression models may be related to a number of methodological limitations of this study that provide signposts for future related work. First, the guiding conceptual framework needs to be further developed to incorporate additional key elements as antecedent constructs in the person-environment relationship. In particular, future conceptual modeling should be extended to examine the congruence of change in the residential environment with relatively stable psychological attributes such as personality style (Golant 1998, 2005). Second, further refinement of the guiding conceptual framework is also desirable in light of the strong possibility that there are interaction effects among the proposed determinants of the personal outcomes. For example,

resident-appraised environmental change may be mediated by both socio-demographic factors and change in personal resources. The strength of the interaction effects that are specified in the conceptual framework may then be determined empirically. Third, it is desirable that longitudinal survey designs track movers over a longer time period to gain a fuller understanding of the residential adjustment process. Moreover, future longitudinal designs should include interview surveys conducted immediately prior to an elder's move to elicit more reliable pre-move data and develop a better understanding of the previous circumstances of the new senior housing tenant. Fourth, an explicit focus on residents with children may improve the performance of variables concerning proximity to informal social support networks in models that predict outcomes of moves to low-income senior housing.

The results reported in this article suggest that policies to improve the circumstances of movers to senior housing projects must recognize the essential relatedness of older persons and their residential settings in a temporal context. Our findings demonstrate how the local neighborhood setting may be treated as an integrative construct in work addressing the changing person-environment interface. In particular, the findings underscore the need for the inclusion of temporal, spatial, and subjective dimensions in the conceptualization of changing relationships of older adults and their local residential environments. Although our study is essentially exploratory and based on a sample with some limitations, the findings do provide a platform for further investigation of the impact of changing residential environments on the experience of aging. To conclude, we anticipate that the results of future related research endeavors in environmental gerontology will further advance the development of comprehensive housing policies targeted to the aging population.

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