JOINT PRODUCTION OF HEALTH WITHIN HOUSEHOLD CONTEXT:

LIVING ARRANGEMENTS, RESIDENTIAL ENVIRONMENT, EMOTIONAL CLOSENESS AND

HEALTH IN OLDER AGE

ABSTRACT

Living arrangements have been linked to poor mental and physical health, but we know little about the pathway that underlies this association and have focused less on the non-independent nature of the health outcomes of people living in the same household. This paper examines joint health outcome of couples in various types of living arrangements by looking at potential pathways that operate through individual *and* family level. We focus residential environments and the quality of couple relationship as mechanisms. We use data from the National Social Life, Health, and Aging Project (NSHAP) and multilevel modeling to analyze nested data structure. Results suggest that residential environment and the quality of relationship mediate the effect of living arrangement on physical and mental health. Single living with children appears to be disadvantaged on both physical and mental health but that effect disappears when residential environments are controlled.

Recent research suggests that people living in some household structures show better health than persons in other types of households. Households vary in size, composition, and other characteristics that could affect various aspect of health. In addition, households are the most immediate social context in which individuals form intimate connections that form the basis of social support and integration. In fact, a large body of research in marriage and family has found a health benefit associated with presence of a spouse. Married people and those in co-resident couples have consistently shown better emotional and physical health, on average, than those living in other types of households. Presence of other people in the household is sometime neutral and sometimes negative, depending on their relationship with the householders; living in a household with a spouse and unmarried children is associated with better health compared to those who are widowed or not married but living with children or other persons (Rogers 1996; Waite and Hughes 1999; Hughes and Waite 2002).

How does the household affect health? Although researchers have outlined the differences in average health among those in different types of households, we know little about the mechanism through which coresidence and relationship produce health for household members. The health outcomes of people in co-resident close, intimate relationships are not independent of one another. We extend previous research by exploring the joint production of health for people living in the same household. We seek to examine the effect of individual level factors *and* household level factors on health outcomes of a married or cohabiting couple. In particular, this research focuses on mechanisms that link living arrangement and health outcome through residential environment, and the quality of couple relationship. We use data from the National Social Life, Health, and Aging Project (NSHAP), a population-based study of 3,005 community-residing older adults conducted in 2005-2006. Multilevel modeling was used to analyze nested structure data and to estimate the unexplained variance in the outcome that is due to unobserved family factors, generally

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known as the random effect.

Household Composition and Health

The household composition is the most immediate social structure that generates certain norms in its adherents and shapes its adherents to adopt certain kinds of orientations to health behaviors. The interaction among household members defines the relative meaning of roles within the household and this, as a whole, defines the norms that are attached to household members. Norms of household are a mixture of the expectation and obligation, demands and pressures accompanied by roles within family. Thus, the presence of and type of others in household composition not only increase the number of person but also reshape the meaning of roles and norms that will eventually shift health behavior among members. For example, married couples living in a multi-generation household are more likely to face multiple roles that require additional time and cost compared to those married couple without other co-residents. It has been suggested, for example, that the presence of a child pushes a couple to adopt more healthy nutrition and to more careful about housing sanitation.

Even if type of living arrangement significantly affects health by generating different level of demands and resource availability, this linkage is often more likely to be amplified or attenuated by some other mediating mechanisms, such as the physical environment of the home and quality of relationship between respondent and spouse.

Household and Spatial Environment

The home environment or housing stressor in negative sense has tremendous effect on mortality and health outcome (Brown, Brolchain, and Harris, 1975; Smith, Smith, Kearns, and Abott, 1993; Payne, 1997; Evans, Wells, Chan, and Saltzman, 2000; for review Evans,

Wells, and Moch, 2003). Major structural deficiencies, such as sagging, cracked, or broken structural elements, and nonstructural deficiencies, such as noise, cold, pest, have significant association with mental health (Duvall and Booth, 1978). Payne (1997) found that those living in housing in a "poor state of repair" are four times more likely to experience isolation, depression, and worries than those in good housing.

The presence of and type of other persons in the household may increase more day-to-day task demands (e.g. household maintenance, cleaning, and laundry) associated with multiple residents. Household members participate in domestic labor and provide each other assistance and care to share everyday task. However, when these tasks are not equally shared, they can be resources for some members while be burden for others. Untidiness, odor, high or low temperature, and noise are not only signs of physical disorder of home environment but may also be indicators of lack of instrumental social support and high task demands within household.

The Quality of Relationship

Although previous research finds that member of married couples with or without their children show the best health, poor relationship quality may intensify psychosocial states (e.g. depressive symptom, stress), which decrease the benefit of being coupled. In other words, closeness of relationships may increase bond between a couples so that it outweigh some negative health effect of being in complex household.[1]

Hypothesis

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[1] Due to the data restriction, we were not able get closeness information between single (widowed, never married, and divorced) and their co-resident members; thus, for current analysis, we restrict our closeness to co-resident couples.

Hypothesis 1a: Living arrangement types are associated with joint health outcome among older adults.

Hypothesis 1b: The association between living arrangement types and self-rated physical health differs from the association between living arrangement and self-rated mental health.

Hypothesis 2a: The physical environment of the home mediates the relationship between living arrangement and joint health outcome.

Hypothesis 2b: Quality of relationship with spouse or co-habiting partner mediates the relationship between living arrangement and joint health outcome.

DATA AND METHODS

We use data from the National Social Life, Health, and Aging Project (NSHAP), a nationally representative population-based study of community-residing older adults. The NSHAP sample was selected from a multi-stage area probability design screened by the Institute for Social Research (ISR) for the Health and Retirement Study (HRS). The HRS design oversampled by race/ethnicity; NSHAP retained this design and also oversampled by age and gender. From summer 2005 to spring 2006, NSHAP interviewed 3,005 individuals, ages 57-85, achieving a final weighted response rate of 75.5 percent.

Most of the data for the NSHAP study were collected during a two-hour in-home interview. Following the in-person interview, respondents were given a paper-and-pencil questionnaire to complete at their leisure and return by mail. The return rate for the leave-behind questionnaire was 84 percent. The overall design of the NSHAP study was modularized, so that some questionnaire items were always included in the in-person questionnaire, while other items were included in either the in-person questionnaire or the leave-behind questionnaire for a randomly-selected subset of respondents.

Self-rated health and Spouse-rated health

Living Arrangement

This study draws living arrangement measures from the ego-centric network roster. The NSHAP's network module concerns those persons with whom a respondent "discusser important matter" within the past twelve months ("name generators").[2] Respondents were allowed to name up to five persons (Network Roster A). If spouse or partner was not included in roster a, respondents were asked to list their spouse or partner in Roster B (only one person). Roster C captures additional one person with whom respondent feel especially close and Roster D captures others in respondent's household which enable us to get full information regarding on whom actually live in household. When discussants were identified, respondents were asked to describe the relationship ("name interpreter") between respondent and alters by selecting from eighteen categories[3] and were asked whether that person lives in the same household. Based on this information, we distinguished eight living arrangement: (a) living with spouse or partner only; (b) spouse or partner and children; (c) spouse or partner and others; (d) spouse or partner, children, and others; (e) single alone; (f) single living with children; (g) single living with others; (h) single living with children and others. The category "single" includes those who do not have spouse or partner regardless of whether

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[2] The wording of question is: "From time to time, most people discuss things that are important to them with others. For example, these may include good or bad things that happen to you, problems you are having, or important concerns you may have. Looking back over the last 12 months, who are the people with whom you most often discussed things that were important to you? Please list these people in Section A of your roster." This question elicits names of strong, frequently accessed, long-term contacts with prominent representation of kin among those cited (Cornwell, B., E. O. Laumann, and L. P. Schumm. 2008; Marsden, P. V. 1987; Ruan, D. C. 1998).

[3] "Which of the following best describes [name]'s relationship to you?" Spouse; Ex-spouse; Romantic/ Sexual partner; Parent; Parent in-law; Child; Step-child; Brothers or sister; Other relative of yours; Other in-law; Friend; Neighbor; Co-worker or boss; Minister, priest, or other clergy; Psychiatrist, psychologist, counselor, or therapist; Caseworker/ Social worker; Housekeeper/ Home health care provider/ Other (*Specify*); Don't know; Refused.

they are never married, widowed or divorced.

Household Earning

We used household earning variable and household earning category variable (e.g. 50K above).

The Home and Neighborhood Environment

The home environment was rated by trained interviewers using a seven items (temperature, light, cleanness, tidiness, noise level, smell, and pleasantness of smell) with response categories ranging from 1-5. Items were scaled with reliability score alpha = .78. Higher number indicates higher physical disorder of the interior of home.

The neighborhood environment was measured by three interviewer-rated items: the conditions of the surrounding building and neighborhood, and the condition or the respondent's building relative to the other buildings in the neighborhoods.

Covariates

We include a number of sociodemographic variables as controls. We measured gender and education as dummy variables (1= female, 0= male; 1 = attend college, 0 = no college education) and age as continuous. All covariates and dependent variables are summarized in Table 1.

ANALYTIC STRATEGY

Multilevel modeling was used to analyze nested structure data. Multilevel modeling provides estimates of the unexplained variance in the outcome that is due to unobserved

family factors, generally known as the random effect. Each dyad (Respondent and their spouse) is nested in family. This means that the characteristics of respondent and spouse should be analyzed at individual level and family features in higher (family) level.

Level 1 [dyad - level]:

Person i (either respondent or spouse) is nested in family j.

$$Health_{ij} = \beta_{oj} + \beta_{1j}age_{ij} + \beta_{2j}Female_{ij} + \beta_{3j}college_{ij} + r_{ij}$$

i: Respondent   *j:* Family

Level 2 [Family - level]:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}LivingArrangement_j + \gamma_{02}Houseincome_j + \gamma_{03}HomeEnv._j + \gamma_{04}BuildingEnv._j + \gamma_{05}Closeness_j + u_{0j}$$

RESULTS

- Table 1. about here –

- Table 2. about here –

- Table 3. about here –

DISCUSSION

Table 2. Multi-level Ordered Logistic Regression of Self-rated Physical Health on Living Arrangement, Home Environment, Spouse Closeness

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Age	0.97**	0.97**	0.97**	0.97**	0.97**	0.97**	0.96**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Female	1.04	1.05	1.07	1.09	1.07	1.04	1.01
	(0.08)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
Attend College	2.15**	1.89**	2.09**	1.87**	1.82**	1.75**	1.62**
	(0.19)	(0.18)	(0.19)	(0.18)	(0.17)	(0.17)	(0.18)
Household Income		1.00**		1.00**	1.00**	1.00**	1.00**
		(0.00)		(0.00)	(0.00)	(0.00)	(0.00)
Household Size		0.92†	1.09	1.09	1.11	1.15†	1.30
		(0.04)	(0.10)	(0.10)	(0.10)	(0.12)	(0.17)
Living Arrangement							
spouse, children			0.77	0.77	0.78	0.80	0.67
			(0.15)	(0.16)	(0.16)	(0.17)	(0.16)
spouse, others			0.35**	0.36**	0.39**	0.39**	0.32**
			(0.11)	(0.11)	(0.13)	(0.13)	(0.12)
spouse, Children, others			0.41*	0.43*	0.47*	0.44*	0.28**
			(0.14)	(0.15)	(0.17)	(0.18)	(0.13)
single alone			0.83	0.92	1.01	1.15	
			(0.12)	(0.14)	(0.15)	(0.19)	
single, children			0.50**	0.54*	0.64	0.63	
			(0.12)	(0.14)	(0.16)	(0.17)	
single, others			0.42**	0.47**	0.58	0.58*	
			(0.12)	(0.13)	(0.17)	(0.16)	
single, children, others			0.26**	0.30**	0.35**	0.35**	
			(0.10)	(0.12)	(0.14)	(0.14)	
Home Environment					0.64**	0.77**	0.79*
					(0.04)	(0.06)	(0.08)
Building and Neighborhood Environment						1.42**	1.41**
						(0.11)	(0.13)
Closeness with Spouse/ Partner							1.43**
							(0.13)
Family Level Random Component	4.35**	4.33**	4.29**	4.28**	4.20**	4.19**	4.01**
	(0.39)	(0.39)	(0.38)	(0.38)	(0.37)	(0.39)	(0.40)
Constant	0.00**	0.01**	0.00**	0.01**	0.00**	0.00**	0.01**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
	0.03**	0.05**	0.03**	0.05**	0.03**	0.03**	0.06**
	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	(0.04)
	0.21**	0.30**	0.22**	0.35*	0.18**	0.22**	0.42
	(0.08)	(0.14)	(0.09)	(0.16)	(0.08)	(0.10)	(0.26)
	2.27*	3.22*	2.33*	3.81**	1.98	2.46*	4.99**
	(0.85)	(1.48)	(0.94)	(1.71)	(0.89)	(1.11)	(3.05)
Observations	4202	4159	4202	4159	4145	3945	2882

z-statistics in parentheses
** p<0.01, * p<0.05, † p<.06

Table 3. Multi-level Ordered Logistic Regression of Self-rated Mental Health on Living Arrangement, Home Environment, Spouse Closeness

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Age	0.98**	0.98*	0.99*	0.99*	0.98**	0.98**	0.98**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Female	0.85*	0.86	0.88	0.88	0.86	0.85	0.85
	(0.07)	(0.07)	(0.08)	(0.08)	(0.07)	(0.08)	(0.08)
Attend College	2.32**	2.06**	2.06**	2.06**	1.99**	1.95**	1.85**
	(0.22)	(0.21)	(0.21)	(0.21)	(0.20)	(0.20)	(0.22)
Household Income		1.00*	1.00*	1.00*	1.00*	1.00	1.00
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Household Size		0.93		1.02	1.05	1.09	1.12
		(0.05)		(0.10)	(0.10)	(0.12)	(0.14)
Living Arrangement							
spouse, children			0.66*	0.65*	0.64*	0.64*	0.62*
			(0.11)	(0.14)	(0.13)	(0.14)	(0.14)
spouse, others			0.71	0.70	0.72	0.73	0.71
			(0.21)	(0.23)	(0.23)	(0.25)	(0.25)
spouse, Children, others			0.76	0.71	0.73	0.64	0.60
			(0.19)	(0.27)	(0.27)	(0.26)	(0.26)
single alone			0.79†	0.80	0.87	0.94	
			(0.10)	(0.13)	(0.14)	(0.16)	
single, children			0.59†	0.59†	0.67	0.64	
			(0.16)	(0.16)	(0.19)	(0.20)	
single, others			0.74	0.73	0.89	0.88	
			(0.23)	(0.23)	(0.28)	(0.28)	
single, children, others			0.33**	0.32**	0.35*	0.35*	
			(0.13)	(0.14)	(0.15)	(0.16)	
Home Environment					0.70**	0.81*	0.86
					(0.05)	(0.07)	(0.09)
Building and Neighborhood Environment						1.31**	1.30*
						(0.11)	(0.14)
Closeness with Spouse/ Partner							2.55**
							(0.25)
Family Level Random Component	5.45**	5.41**	5.38**	5.38**	5.32**	5.33**	5.01**
	(0.51)	(0.51)	(0.51)	(0.50)	(0.49)	(0.51)	(0.50)
Constant	0.00**	0.00**	0.00**	0.00**	0.00**	0.00**	0.03**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)
	0.02**	0.02**	0.02**	0.02**	0.01**	0.02**	0.32
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.22)
	0.16**	0.22**	0.22**	0.23**	0.14**	0.16**	3.27
	(0.06)	(0.11)	(0.11)	(0.11)	(0.07)	(0.08)	(2.22)
	1.90	2.65	2.65*	2.70*	1.67	1.98	41.52**
	(0.77)	(1.36)	(1.29)	(1.35)	(0.84)	(1.01)	(28.85)
Observations	4206	4164	4164	4164	4150	3949	2884

z-statistics in parentheses
** p<0.01, * p<0.05, † p<.06