Family resources and cognitive decline among elderly in Italy

Stefano Mazzuco, Silvia Meggiolaro and Fausta Ongaro

Abstract Family and children may play an important role in the well-being of the elderly. In this paper, we examine the association between living arrangement and the cognitive decline among people over 65 in Italy in the hypothesis that living with others may have positive effects on cognitive functioning in comparison with living alone. Data come from SHARE survey, which provides five indicators of cognitive functions: orientation, memory, recall, verbal fluency and numeracy. Cognitive decline was measured considering whether individuals have a decrease between the first and the second wave in each of these five abilities. Results showed that the "effects" of living arrangement are different according to the specific measure of cognitive decline. More in depth analyses will take into account selection provided by attrition between the first and the second wave and the "re-test effect".

1 Introduction

Family and children may play an important role in the well-being of the elderly. In fact, little is known about the specific effects on the cognitive functioning, even if it is of particular interest in ageing societies: future elderly will have narrower kinship networks due to decreasing fertility, increasing female participation to labour market, and increasing divorce rates. In addition, given the increasing trend of life expectancy, they will experience higher risks of degenerative diseases. Therefore, if living arrangement in later life significantly affects health of elderly (Hays, 2002; De Jong Gierveld and Van Tilburg, 1999), this will inevitably have repercussions in the well-being of future elderly. elderly living with children are more likely to be selected, i.e. those with worse health are less likely to be left alone, and therefore more likely to live with their children, if they have any. In general, co-residence with children may mean support for the psychological health of elderly parents, even in case of decrease of autonomy and physical and economic dependence. Conversely, older adults who live

Stefano Mazzuco, Department of Statistical Sciences, Univ. of Padova, mazzuco@stat.unipd.it
Silvia Meggiolaro, Department of Statistical Sciences, Univ. of Padova, meg@stat.unipd.it
Fausta Ongaro, Department of Statistical Sciences, Univ. of Padova, ongaro@stat.unipd.it

alone may be more vulnerable to psychological and physical well-being decline (Kharicha et al., 2007).

In this light, we examine the association between living arrangement and the cognitive decline among people over 65 in a context, such as Italian one, characterized by strong family ties and, at the same time, a particularly old age structure.

2 Data and methods

Data used in this paper are taken from the first two waves of the Survey of Health, Ageing, and Retirement in Europe (SHARE) in 2004 and 2006/2007. SHARE provides longitudinal information on health and socio-economic status, and social and family networks of non-instituzionalized adults aged 50 or over representing the various European regions (Börsch-Supan et al., 2005).

Five different measures for cognitive functions are available: orientation (measuring orientation for time), memory and recall (ability of recalling some words from a list), verbal fluency (indicator of executive function), and numeracy (ability to perform numerical operations).

Cognitive decline was measured considering whether there is a decrease or not in each of the five indicators of ability for individuals aged 65 or over between the first and the second wave. In the first wave of SHARE, the Italian sample of individuals aged 65 or over consisted of 1,123 individuals: the present paper focuses on 770 individuals (68.6%) still alive in the second wave (49 individuals died before the second wave, and 304 individuals have not been re-interviewed, but we do not why).

3 Results

Table 1 reports the percentages of individuals with cognitive decline in different abilities according to the living arrangement in 2004 (35 individuals living in other family forms were excluded due to their small sample size). In these descriptive analyses, the "effects" of living arrangement seem to be different according to the specific measure of cognitive decline. Individuals living alone show the highest decline in cognitive abilities such as orientation, recall and numeracy; but, the opposite happens for some other abilities, such as memory and verbal fluency, for which individuals living alone show the lowest decline. Intermediate situations characterized elderly living only with their partners.

Table 1: Percentages of elderly with cognitive decline in different abilities by living arrangement

	Orientation	Memory	Recall	Verbal fluency	Numeracy
Alone	19.4	31.9	38.5	35.3	28.2
Couple alone	17.1	33.1	33.6	41.9	24.7
With children	10.9	37.1	32.9	45.3	26.7

Clearly, these descriptive results do not control for other factors which can be source of bias (for example, health and socio-economic characteristics). In order to assess whether there was an independent effect of living arrangement on cognitive decline in different abilities, separate multivariate analyses were carried out for each cognitive domain. In particular, the dependent dichotomous variables (cognitive decline in the five different abilities) are analyses through logistic regression models.

The covariates measuring health status consider several aspects: the baseline cognitive functioning (measured at wave 1, for each of the five abilities); the diagnosis of some chronic diseases (heart disease, stroke, and diabetes); the level of difficulty in performing eight Instrumental Activities of Daily Living (IADL); and the mental health (EURO-D scale). Physical function was categorized as normal (without any difficulty), mild disability (with difficulties in one or two activities of IADL) and severe disability (with difficulties in more than two activities of IADL). Respondents with EURO-D scores ranging from 0 to 3 were defined as "no depressed", those with 4 or 5 as "mildly depressed", while those with more than 5 as "severely depressed".

Socio-demographic factors include age, gender, and educational level. Education was divided into low (illiterate or elementary), middle (secondary school), and high (high school or above). In addition, the household economic situation is considered through the household total net worth[2]. 1st and the 2nd wave of the survey is taken into account.

Table 2: Factors influencing the risk of cognitive decline in different abilities (logistic models)[a].

	Orientation	Memory	Recall	Verbal fluency	Numeracy
Living arrangement (ref: alone)					
Couple alone	0.20	-0.02	-0.41	0.22	-0.69**
With children	-0.51	0.23	-0.60**	0.42	-0.13
Education (ref: low)					
Middle	-0.27	-0.55*	-0.53*	-0.30	-0.66**
High	-0.28	-0.96***	-0.92***	-1.02***	-1.25***
Wealth (ref: 1st quartile)					
2nd quartile	0.25	0.54**	-0.54**	-0.26	0.17
3rd quartile	-0.49	-0.14	-0.66**	-0.37	-0.12
4th quartile	0.22	0.09	-0.34	-0.09	0.01
Physical function (ref: normal)					
Mild disability	0.53*	0.36	-0.11	0.48*	0.87***
Severe disability	1.34***	0.91**	-0.12	0.75*	0.29
Depression (ref: no)					
Mildly depressed	0.31	0.16	0.21	-0.26	-0.05
Severely depressed	0.44	0.24	0.38	-0.04	0.27

$* = p < .10$, $** = p < .05$, $*** = p < .01$

[a] The models control for age, gender, baseline cognitive functioning, heart disease, stroke, diabetes, and presence of other individuals during the interview.

Results reported in Table 2 show that, net of other controls, the effect of living arrangement is significant only for recall and for numeracy. In particular, living with children decreases the risk of cognitive decline in recall ability in comparison with

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[2] Following the definition used by other researches (see Avendano et al., 2009), this is the sum of all financial and housing wealth minus liabilities, divided by the square root of household size.

living alone and, similarly, individuals living only with their own partner have a lower risk of decline in numeracy than those living alone.

4 Future research

In the future, we will take into accounts two source of selection that might undermine the results of these multivariate analyses. A first potential source of bias is the selection effects due to attrition: respondents experiencing a heavier cognitive decline are more at risk of death, institutionalization, or health decline, and so less likely to be interviewed in the second wave. This selection effect can be taken into account by modelling risk of attrition jointly with cognitive decline. Another source of bias arises from what is generally referred to as "re-test effect": at each assessment of cognitive ability, people might learn from the test they are asked to do, and this might influence the performance and the next measurement. It has been found that this effect produces an upward bias in cognitive abilities measurement (Ferrer et al., 2004). Since none of the models suggested by literature to separate retest effects can be applied to our data (as more than two waves are needed), an alternative approach is proposed. We will estimate retest effects using data from wave 2 and comparing cognitive abilities of individuals who have been interviewed also in the first wave with those of individuals who are interviewed for the first time (refresh sample). Controlling for basic background characteristics and conditioning to household structure, we will get the retest effects for each household structure and this will help us to interpret the results of the multivariate analysis described above. In addition, intra-household learning (i.e. respondents may learn from the response given by other interviewed household members) is also an issue that will be considered (Mazzonna and Peracchi, 2009).

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