

# Family resources and cognitive decline among elderly in Italy

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**Abstract** Family and children may play an important role in the wellbeing of the elderly. In this paper, we examine the association between living arrangements 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 indicators.

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 both selection provided by attrition between the first and the second wave and “re-test effect”.

## 1. Introduction

Family and children may play an important role in the well-being of the elderly (Zunzunegui et al., 2001). In fact, little is known about the specific effects on the cognitive functioning but 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, this will inevitably have repercussions in the well-being of future elderly. According to the existing literature, the living arrangements of older persons may be important, even though results show mixed evidence (Hays, 2002). Living alone has been associated with better mental health and vitality over time (Michael et al., 2001), but other works stressed the benefits of moving closer to or into the same residence with others (De Jong Gierveld and Van Tilburg, 1999). Clearly, 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. At the opposite, older adults who live alone may be more vulnerable to decreased psychological well-being and to adverse health outcomes (Kharicha et al., 2007, Van Gelder et al., 2006).

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

We might expect that, in general, living with others may have positive effects on cognitive functioning. Probably living with a spouse provides more psychological support than living alone; living with children may provide more social and practical support and a sense of security, instead. These different forms of support obtained when living with others should bring about beneficial effects and consequently a lower decrease of elderly cognitive functioning in comparison with that of elderly living alone.

## 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<sup>1</sup> adults aged 50 or over representing the various European regions (Börsch-Supan et al., 2005).

Five different measures for cognitive functions are available: orientation, memory, recall, verbal fluency and numeracy. Orientation is a basic cognitive functioning indicator measuring orientation for time. Memory and recall referred to the ability of recalling some words from a list. Verbal fluency is an indicator of executive function. Numeracy measures the ability to perform numerical operations. Each ability was measured with different tests leading to different measures: orientation and numeracy are described by five-categories variables; memory and recall range from 0 to 10 and verbal fluency has values ranging from 0 to 33 in the current sample.

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 corresponding to 4.4% 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

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

Clearly, these descriptive results do not control for other factors which can be source of bias. First of all, health is one of the most significant determinants of living arrangements: individuals living alone are probably those with a good health and a high cognitive level. So the first aspect that should be controlled for is the health status. Similarly, other socio-demographic and socio-economic background factors should be taken into account. 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 these analyses each ability variable entered as dependent variable and the other variables – living arrangements, health status, socio-demographic and socio-economic background – are considered as covariates. 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 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 (measured by the EURO-D scale). Physical function was categorized as normal (without any difficulty), mild disability (with difficulty in one or two activities of IADL) and severe disability

<sup>1</sup> The focus only on non-instituzionalized population clearly leads to an overestimation of wellbeing.

(with difficulty 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<sup>2</sup>. The differences in the number of household members are accounted dividing wealth by the square root of household size (Avendano et al., 2009). In the following analyses, wealth is collapsed into quartiles.

Lastly, the presence of individuals during the cognitive section of the interview both in the first and in the second wave of the survey is taken into account.

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

**Table 2:** Factors influencing risk of cognitive decline in different domains according to logistic models.

|   | Orientation | Memory   | Recall   | Verbal fluency | Numeracy |
|---|-------------|----------|----------|----------------|----------|
| <b>Living arrangement</b> (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    |
| <b>Age</b>  | 0.07***     | 0.07***  | 0.03*    | 0.05***        | 0.05***  |
| <b>Gender</b> (ref: female)                         | -0.28       | 0.02     | 0.07     | -0.20          | -0.47**  |
| <b>Education</b> (ref: low)                         |             |          |          |                |          |
| Middle  | -0.27       | -0.55*   | -0.53*   | -0.30          | -0.66**  |
| High  | -0.28       | -0.96*** | -0.92*** | -1.02***       | -1.25*** |
| <b>Wealth</b> (ref: 1 <sup>st</sup> quartile)       |             |          |          |                |          |
| 2 <sup>nd</sup> quartile                            | 0.25        | 0.54**   | -0.54**  | -0.26          | 0.17     |
| 3 <sup>rd</sup> quartile                            | -0.49       | -0.14    | -0.66**  | -0.37          | -0.12    |
| 4 <sup>th</sup> quartile                            | 0.22        | 0.09     | -0.34    | -0.09          | 0.01     |
| <b>Baseline cognitive functioning</b>               | 0.55***     | 0.90***  | 0.86***  | 0.19***        | 1.45***  |
| <b>Hearth disease</b> (ref: no)                     | -0.28       | -0.05    | 0.18     | -0.09          | -0.19    |
| <b>Stroke</b> (ref: no)                             | -0.25       | 0.17     | -0.72    | -0.18          | 0.91*    |
| <b>Diabetes</b> (ref: no)                           | 0.43        | 0.63**   | 0.61**   | 0.23           | -0.07    |
| <b>Physical function</b> (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     |
| <b>Depression</b> (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     |
| <b>Respondent alone - wave 1</b> (ref: with others) | -0.20       | -0.41*   | -0.16    | -0.35*         | 0.04     |
| <b>Respondent alone - wave 2</b> (ref: with others) | -0.37       | 0.02     | -0.54**  | -0.13          | -0.40*   |

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

<sup>2</sup> Following the definition used by other researches (see Avendano et al., 2009), this is “the sum of all financial (net stock value, mutual funds, bonds, and savings) and housing wealth (value of primary residence net of mortgage, other real estate value, own business share, and owned cars) minus liabilities”. Missing items were imputed using the methodology of multiple imputation (see SHARE Release Guide 2.5.0 waves 1& 2, Mannheim Research Institute for the Economics of Aging, 2011).

#### 4. Future research

In the future, we intend to analyse more in depth these results. We will particularly take into account two source of selection that might undermine the results of these multivariate analyses. A first potential source of bias is determined by 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, a solution that has been already used (see, for example, Lillard and Panis, 1996). 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. This effect has been tested in several ways (Ferrer et al., 2004) and it has been found that it produces an upward bias in cognitive abilities measurement. Since none of the models suggested by literature to control separate retest effects (Ferrer et al., 2004) 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 (e.g. sex, age and education) 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, in principle, SHARE interview rules should have prevented, but in practice these rules have not been applied in all cases. Mazzonna and Peracchi (2009) have found that the intra-household learning effect is positive, significant and increasing in the level of education. Clearly, intra-household learning is associated with household structure, so that we need to tackle this aspect. This will be taken into account by using the information on whether the respondents have witnessed the interview of another household member, as suggested by Mazzonna and Peracchi (2009).

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