

# Support provided by elderly Italian people: a multilevel analysis

## *L'aiuto offerto dagli anziani italiani: un'analisi multilivello*

Elvira Pelle, Giulia Rivellini and Susanna Zaccarin

**Abstract** The characteristics of social networks determine the availability of social support, that is the aid individuals gain from their network members. Despite the literature usually investigate the importance of having support, the role of the support provided to alters had not yet received the same attention. In particular, the support elderly provide to their networks members shows an active participation in the social life, that is one dimension of the active ageing. Using data from 2009 edition of “Famiglia e Soggetti Sociali (FSS)” survey carried out by the Italian National Statistical Institute, we propose a Bayesian multilevel model to highlight the determinants of observing a provided support tie by elders to family or non-family members.

**Abstract** *Le caratteristiche della rete sociale in cui un individuo è inserito determinano la disponibilità di supporto ricevuto dai membri della rete. Sebbene la letteratura si concentri sull'importanza di ricevere aiuto, minore attenzione è dedicata all'analisi dell'aiuto fornito. Per gli anziani, per esempio, l'aiuto dato ai membri della loro rete è segno di un'attiva partecipazione alla vita sociale, che rappresenta una dimensione dell'invecchiamento attivo. Usando i dati 2009 dell'indagine Istat su "Famiglia e Soggetti Sociali" (FSS), si propone un'analisi multilivello per evidenziare le caratteristiche della popolazione anziana (persone di età 65 e oltre) e dei loro alter che influenzano la probabilità di dare aiuto a familiari e non familiari.*

**Key words:** ego-centered support network, provided and received support, Bayesian multilevel model

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## 1 Introduction

The characteristics of social networks and their composition determine the availability of social support, which, in turn, is defined as the aid that individuals gain from their network members [15, 5]. Whatever the type of support (emotional, informational and instrumental), a growing number of studies have documented the positive influence of social support and social network on various health outcomes and wellbeing (among others, see [17]). Social interactions have the potential to protect individuals at risk (e.g., encouraging them to develop adjustment to face the difficulties) and promote positive personal and social development; as consequence the exposure to various types of stress diminishes [14, 8] while there is an increasing of the ability of coping with it. Despite the literature usually investigate the importance of having support, especially that received from the personal network, the role of the support provided by ego to alters had not received the same attention. Focusing on elderly people, the support they provide to their networks members can be view as a sign of an active participation in the social life; the latter is one dimension of the active ageing, a multidisciplinary concept that identify both experience and capability of being autonomous in the economic, political and social life [4].

In a familistic country such Italy informal intergenerational transfers are the most important pillar of the national welfare system, replacing formal sources of support [9]. Moreover, recent analyses on the individual potential support ego (PSE) networks in Italy [2] provides evidence to the existence of sources of potential support that extend beyond the family circle.

The aim of this contribution is to study the types of support provided by the elderly to other people, stressing how features of both ego (the elderly) and alters in their network (siblings, children, grandchildren, other relatives, neighbors, friends) affect the form of aid given. Using data from Family and Social Subjects (FSS) survey carried out in 2009 by the Italian National Statistical Institute, in this study we propose a Bayesian multilevel model to highlight the determinants of observing a provided support tie by elders to family or non-family members, controlling also for the kind of PSE-network in which the elders are embedded.

The remain of the article is organised as follow: in Section 2 we present the characteristics of elderly Italian people along with the characteristics of their potential support network. In Section 3 we describe the multilevel approach used to investigate the provided support given by elderly. Section 4 ends the paper with a discussion and some concluding remarks.

## 2 Individual (ego) characteristics, network typologies and support exchanged

In this work we exploit data drawn from “Family and Social Subjects” (FSS) survey carried out by the Italian National Statistical Institute in 2009. Since 1998, FSS

is part of the Multipurpose Survey Program on Italian households and represents the primary statistical source providing information on contacts and provided and received support by Italian individuals. 2009 FSS edition involved 43850 individuals living in about 24000 family units. We focus on Italian individuals aged 65 years and more ( $n=9202$ , 21% of the total). Looking at the gender, 57% are females, while 43% are males. Most of elders are in couple (married or unmarried) without cohabiting children (45.9%), while 15.3% are in couple with cohabiting children; 27.8% live as single (without other members), 6.3% are single-parents and 4.8% have other family typologies. More than half of the elders (51.3%) are aged 65-74ys, while the oldest-old (85+) are the 11.6% of the total. With respect to the place of residence, 42.8% of elders live in the North of Italy, 38% in the South or Islands, and the remaining 19.2% in the Center. Looking at the health, 76.7% declare to have good/satisfactory health conditions.

Following the methodological approach proposed in [1], we use data from the FSS on the presence and the contacts with siblings, children, grandchildren, other relatives, neighbors and friends, to define the potential support ego-centered (PSE)-network in which Italian elders were embedded. In particular, PSE-network is defined as “the set of not-cohabiting people (along with their role relations) who can be a possible source of support to the respondent” [1, p. 6]. The average number of alters is quite small (2.65). Some differences in the network size emerge by age classes: 48% among the oldest-old (80+) have a number of alters between 1 and 2, while 47% of the group of 65-69ys old have 2-3 alters.

We grouped the 6 identified potential alters in the ego-centered network in 3 main networks' typologies: “Immediate family” (siblings and children), “Extended family” (grandchildren and relatives) and “No family” (neighbours and friends). The most widespread network typology among the elderly is the *Comprehensive* one composed by siblings, children, grandchildren and other relatives plus friends and neighbors (30.7% of individuals aged 65+), followed by more oriented *family* network typologies with alters only from Immediate and Extended family (28%) or only children and siblings (9.9%).

FSS supplies also data on several types of provided and received support by respondents, with detailed information on the nature and the characteristics of the recipient. Looking at the support received by elderly, only 16.6% declared to have received support from a non-cohabiting people; on the other hand, about 26% of the elders declared to provide support to non-cohabiting people (55% of which are females and 45% are males) inside or outside their family circle. The provided support to the non-familiar circle represents about the 30%, with some relevant differences with respect to the place of residence (51.3% for elders living in the North of Italy, 30.6% for those in the South or Islands, while only 18.1% for those living in the Center). We highlight some differences according to the most important type of support provided to a family or non-family member: for the first category the most provided types of support are the care of children (51.6%) and monetary help (12.7%), while for the latter are keep company (23.3%) and economic help (17.4%).

### 3 Multilevel analysis

We propose a multilevel approach in order to analyse the network characteristics of the group of the 2386 elders who declare to provide support [10, 3]. In particular, we adopt a Bayesian multilevel analysis [6] to provide a new insight into the determinants of observing a provided support tie (our dependent variable) by elders to family or non-family members. We use a Bayesian approach mainly for two reasons: first, given the particular structure of our data, it allows a great flexibility in the estimation of multilevel models; second, it offers some advantages in terms of computational ease, as models can be easily estimated using the package “rstanarm” of the language Stan available in R.

We specify a 3-level logistic regression model for the presence of a support tie to a family member as opposed to a non-family member, where level 3 is represented by the Italian regions to account for geographical variation in providing support to family or non-family alters (denoted by  $k$  subscript), level 2 is represented by ego (denoted by  $j$  subscript) and level 1 (denoted by  $i$  subscript) by the alter. The model can be summarised as follow:

$$\text{logit}(\pi_{ijk}) = \beta_{jk} + \mathbf{x}'_{ijk}\beta \quad (1)$$

where  $\pi_{ijk}$  is the probability that the observed support tie between alter  $i$  and ego  $j$  within region  $k$  is to family members;  $\beta_{jk}$  is the intercept varying by level-two unit  $j$  and level-three unit  $k$  and  $\mathbf{x}'_{ijk}\beta$  are models fixed effects, which may be characteristics of the ego, alters and the dyad ego-alter. In particular, gender, age, family typology, education, health conditions and PSE-network typology (comprehensive, family and other) are considered as egos attributes.

It is well known that homophily is an important explanatory factor for the configuration of personal networks [12, 11, 13]. To gain insight into the determinants of giving support, we also test two hypotheses: first the homophily by gender (the elders are easier willing to provide support to individuals of the same gender). Second, the type of personal network in which the elder is embedded can determine the homophily by generation: an intergenerational PSE-network facilitates the so-called intergenerational transfers; on the other hand, an intragenerational PSE-network eases intragenerational transfers. Thus, to take into account homophily, from information on alters we construct the two variables “same generation” and “same gender” (comparing the birth generation and gender of both ego and alter, where available).

To compare models, we use the leave-one-out information criterion (looic), that uses the log-likelihood evaluated at the posterior simulations of the parameter values [7, 18]. Note that the lower the value of looic, the higher the fit of the model.

First of all, we compare the single alter-level null model and the 3-level null model. The improvement in terms of looic (from looic=3831.3 to looic=3679.3) indicates that the multilevel approach we propose is suitable to investigate our data structure.

We consider 3 models: model 1 with only characteristics of ego; model 2 with characteristics of ego and homophily terms for generation and gender and model 3 including in model 2 the type of support provided. As usual in Bayesian analysis, we monitored the Markov Chain convergence through the Gelman-Rubin statistic  $\hat{R}$  [6]: chains convergence has been reached for all the estimated models, since the value of such statistic is below the recommended value of 1.1. Table 1 summarises the results.

**Table 1** Results of Bayesian multilevel models: posterior quantiles at 50%; 2.5% and 97.5% in brackets

	Model 1 (looic: 3473.3)		Model 2 (looic: 2858.7)		Model 3 (looic: 2344.8)	
	median		median		median	
(Intercept)	0.2	(-0.7;1.1)	-0.3	(-1.2;0.6)	1.5	(0.7;2.5)
<i>Gender</i> (cat ref: Male)						
Female	0.0	(-0.3;0.3)	-0.2	(-0.5;0.1)	-0.4	(-0.7;-0.1)
<i>Living arrangement</i> (cat ref: Other)						
Couple with cohabiting children	0.5	(-0.2;1.3)	0.4	(-0.4;1.1)	0.3	(-0.4;1.1)
Couple without cohabiting children	1.0	(0.3;1.7)	1.0	(0.3;1.8)	0.8	(0.1;1.5)
Single-parent	-0.1	(-1.0;0.8)	-0.3	(-1.2;0.6)	-0.1	(-0.9;0.8)
Single	0.0	(-0.7;0.8)	0.1	(-0.6;0.8)	0.2	(-0.5;0.9)
<i>Age</i> (cat ref: 65-69)						
70-74	-0.3	(-0.6;0.1)	-0.1	(-0.4;0.2)	-0.1	(-0.5;0.2)
75-79	-0.4	(-0.8;0.0)	-0.4	(-0.8;0.0)	-0.2	(-0.6;0.1)
80-84	-1.2	(-1.7;-0.7)	-1.0	(-1.5;-0.5)	-0.6	(-1.1;-0.1)
85+	-1.1	(-1.8;-0.4)	-1.1	(-1.9;-0.4)	-0.7	(-1.4;0.0)
<i>Health conditions</i> (cat ref: Good)						
Bad	0.1	(-0.3;0.5)	0.0	(-0.4;0.4)	0.2	(-0.2;0.6)
Satisfactory	0.1	(-0.2;0.4)	0.0	(-0.3;0.3)	0.0	(-0.3;0.3)
<i>PSE Network</i> (cat ref: Comprehensive)						
Family	0.4	(0.1;0.7)	0.4	(0.1;0.7)	0.3	(0.1;0.7)
Other	-1.6	(-2.0;-1.2)	-1.7	(-2.1;-1.3)	-1.0	(-1.3;-0.6)
<i>Education</i>	0.1	(0.1;0.2)	0.1	(0.0;0.2)	0.1	(0.1;0.2)
<i>Homophily of ego-alter</i>						
Same generation			6.4	(4.6;9.0)	6.8	(5.1;9.2)
Same gender			7.0	(5.4;9.6)	7.1	(5.4;9.5)
<i>Type of support</i> (cat ref: kid care)						
Companionship					-3.7	(-4.4;-3.1)
Material/Other					-3.1	(-3.7;-2.6)
Economic					-2.5	(-3.1;-2.0)

Model 1 provides a good improvement in the fit with respect to the null model (looic= 3473.3). Elders who live in couple without cohabiting children are more likely to provide support to a family member if compared with other living arrangements, while this probability decreases as the age of ego increases. With respect to egos which can count on a *comprehensive* PSE-network, egos embedded in a *family* network typology tend to have a greater probability of a support tie to a family member, while this is less likely for ego embedded in other kinds of network. The

perceived health conditions as well as the gender of the ego do not have an impact on the probability of a support tie to a family member.

According to the loaic measure, adding homophily (model 2) terms to model 1 results in a remarkable improvement in the model fit (loaic=2858.7, compared with the previous value of 3473.3). Parameter estimates for both generation and gender homophily have an impact on the probability of a family support tie; in particular, it is more likely to observe a support tie to a family member when ego and alter belong to the same generation as well as when they are of the same gender.

Considering also the type of support provided by ego (model 3), the model fit is still improved, with a loaic=2344.8. According to the model estimates, with respect to provide support for kid care, it is less likely that other types of support (such as companionship, economic and other material support) are provided to a family member.

## 4 Conclusions

We proposed a Bayesian multilevel analysis of support ties provided by elders to family or non-family members. Some differences in the probabilities of ties to family alters compared with non-family alters can be noted: older elderly are less likely to provide support tie to their family circle as well as among the types of support the kid care is the more likely to be provided to a family member. Homophily between ego and alters appears to be an important explanatory factor in providing support, in particular with respect to gender and generation as revealed by our results. This can be interpreted as an evidence of a positive disposal elders have (or, more in general, people have) to provide aid to their family members also on the basis of same life experiences and attitudes.

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