

THE UNINTENDED CONSEQUENCES OF CAREGIVING:
THE EFFECTS OF INFORMAL CARE ON COGNITIVE FUNCTIONING
OF OLDER PARENTS

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INTRODUCTION

- The proportion of the older individuals in needs of long-term care in the population is expected to increase over the next decades.
- Informal care is the largest source of long-term care for older individuals, surpassing home health care and nursing home care. For older parents, adult children are the most common type of care providers (Norton, 2000).
- In order to limit the expected increase in long-term care expenditures, one suggested solution is to further encourage the development of informal care.

INTRODUCTION

- However, several studies highlight different factors that need to be taken into account in order to evaluate the such policy.
- Informal care imposes large opportunity costs on the labour market for the caregivers (Van Houtven *et al.*, 2013).
- Informal care has negative impacts on several dimensions of health of the caregivers (Schulz *et al.*, 1995; Pinquart and Sörensen, 2003; Vitaliano *et al.*, 2003; Kyung Do *et al.*, 2013).
- Less attention has been devoted to the consequences on the care receivers, except Barnay and Juin (2016) and Byrne et al. (2009).

INTRODUCTION

- In this study, we aim at identifying the causal effect of informal care on one particular aspect of the care receiver's health: cognitive functioning.
- Performance on a wide variety of cognitive tasks systematically declines with age (Dixon *et al.*, 2004; Salthouse, 1996; Van der Linden *et al.*, 1994).
- Cognitive impairment represents a major public health burden. It is associated with loss of quality of life, increased dependency, and higher health-related expenditures (Albert *et al.*, 2002; Lyketsos *et al.*, 2002; Tabert *et al.*, 2002).
- Maintaining good cognitive functioning is a key ingredient for successful ageing.

COGNITIVE FUNCTIONING AND INTERGENERATIONAL INTERACTIONS

- Individual heterogeneity in the level and the rate of age-related change of cognitive functioning is associated with lifestyle, such as the engagement in mentally stimulating activities (Salthouse, 2006).
- Several studies point to a positive link between social interactions and several health outcomes (see reviews by Berkman *et al.*, 2000; Cohen, 2004), including cognitive functioning (Bassuk *et al.*, 1999; Fratiglioni *et al.*, 2000; Ertel *et al.*, 2008; Ybarra *et al.*, 2008).
- Family members crossing generations are an important source of social interaction and support for older individuals (Connidis and Davies, 1990; Hall and Wellman, 1985).

COGNITIVE FUNCTIONING AND INFORMAL CARE

- Possible negative impacts of informal care in later life:
 - *Dependency-support and independence-ignore script*
 - *Learned helplessness*
 - *Theory of social breakdown*

Overly vigorous social support provided to vulnerable older persons may result in greater dependency by causing skills to atrophy and competence to erode.

COGNITIVE FUNCTIONING AND INFORMAL CARE

- Important to identify both types of interactions as each of them is likely to affect cognitive functioning in a different direction:
 - Intergenerational contacts is expected to have a positive effect on cognitive functioning.
 - Caregiving is expected to adversely affect cognitive functioning.

EMPIRICAL ISSUES

- The equation to be estimated is the following:

$$C_{ict} = \alpha_0 + \alpha_1 X_{ict}' + \alpha_2 IC_{ict} + \alpha_3 contacts_{ict} + \epsilon_{ict}$$

- The parameter of interest α_2 and α_3 can be estimated by Ordinary Least Squares under the assumption that the error term is uncorrelated to IC_{ict} , $contacts_{ict}$ and X_{ict} .
- This assumption is unlikely to hold in the current context for at least three reasons:
 - Unobserved heterogeneity
 - Reverse causality
 - Measurement error

EMPIRICAL STRATEGY

Instrumental Variables approach

$$\text{Structural equation: } C_{ict} = \alpha_{0ct} + \beta_1 X_{ict}' + \beta_2 IC_{ict} + \beta_3 contacts_{ict} + \epsilon_{ict}$$

$$\text{First stage equation: } IC_{ict} = \alpha_{0ct} + \beta_1 X_{ict}' + \beta_2 share_{ict} + \beta_3 share_{ict} difemp_{ct} + \epsilon_{ict}$$

$$\text{First stage equation: } contacts_{ict} = \alpha_{0ct} + \beta_1 X_{ict}' + \beta_2 share_{ict} + \beta_3 share_{ict} difemp_{ct} + \epsilon_{ict}$$

$$\text{Reduced form equation: } C_{ict} = \alpha_{0ct} + \beta_1 X_{ict}' + \beta_2 share_{ict} + \beta_3 share_{ict} difemp_{ct} + \epsilon_{ict}$$

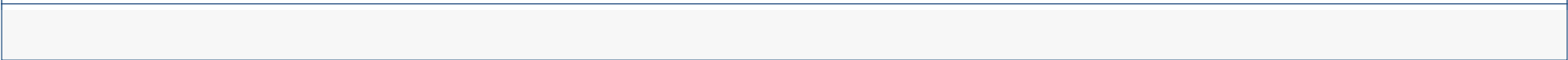
IDENTIFICATION STRATEGY

Validity of the gender mix of children as an instrument for informal care:

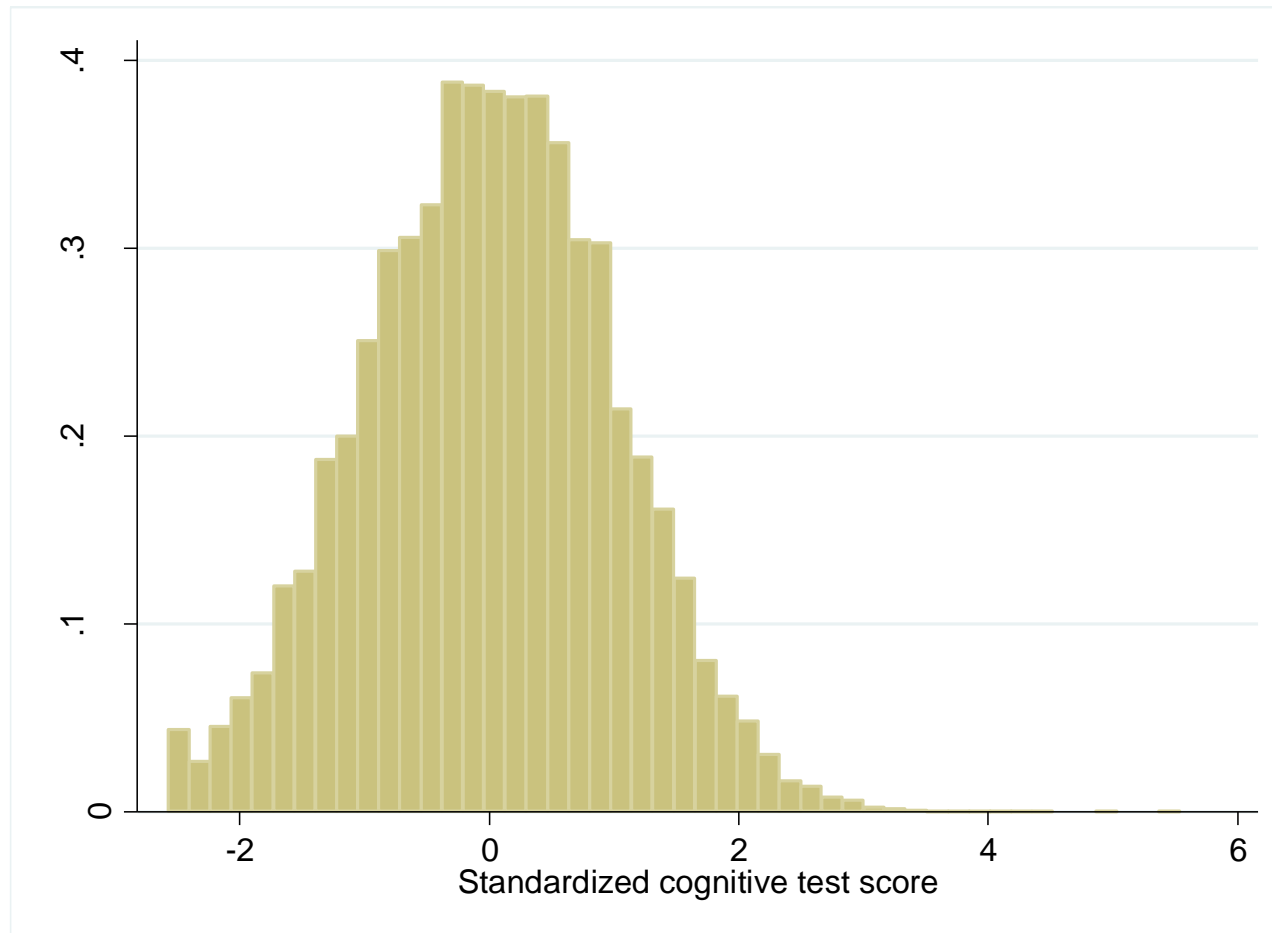
- Daughters provide more care to their parents (e.g. Horowitz, 1985; Spitze and Logan, 1990).
- Gender of children is plausibly randomly distributed with respect to major sources of heterogeneity such as preferences and ability.
- Gender mix of children can be argued as exogenous, conditional on the number of children.
- Identification strategy also used by e.g. Lo Sasso and Johnson (2002), Van Houtven and Norton (2004), Charles and Sevak (2005), Bonsang (2009), Barnay and Juin (2016).

DATA

- The Survey of Health, Ageing and Retirement in Europe (SHARE) 2004 – 2013.
- SHARE includes extensive survey information on health, employment, financial situation, family and activities of a representative sample of the 50+ population in 19 European countries and Israel (Boersch-Supan et al. 2005; 2008).
- Sample selection: All non-working individuals aged 65 years-old or more who have at least one child and live alone.
- Final sample: 19,613 observations



DATA: DISTRIBUTION OF THE STANDARDIZED COGNITIVE SCORE



DATA

- Informal care is derived from three questions asking the **relationship** with the caregiver, the **frequency** (daily, weekly, monthly, less often) and the average number of **hours** per day/week/month/year respectively.
- The final measure of informal care corresponds to the number of hours of informal care received from all the children per month.

DATA

- Contacts with children is derived from the question: During the past twelve months, how often did you (or your husband/wife/partner) have contact with {child name}, either personal, by phone or mail?
 1. Daily (365)
 2. Several times a week (156)
 3. About once a week (52)
 4. About every two weeks (26)
 5. About once a month (12)
 6. Less than once a month (6)
 7. Never (0)
- Our final measure consists in the number of contacts with the children per month.

DATA

- Control variables:
 - Country-wave dummies to account for cross-country differences in cultural and institutional backgrounds.
 - A dummy for being born abroad.
 - Age.
 - Level of education calculated according to the ISCED-97 classification (OECD, 1999).
 - Number of children.
 - Health and functional status: heart-related disease, stroke, or diabetes, number of mobility limitations, number of limitations with daily activities (ADL).

DATA: DIFFERENCES IN EMPLOYMENT RATE OF SONS AND DAUGHTERS ACROSS COUNTRY AND WAVE

	Wave 1	Wave 2	Wave 4	Wave 5
AT	14%	13%	10%	8%
BE	13%	14%	11%	9%
CH	26%	15%	15%	13%
CZ		12%	9%	9%
DE	16%	15%	9%	11%
DK	10%	7%	7%	4%
EL	34%	33%		
ES	38%	34%	25%	14%
EST			5%	7%
FR	13%	13%	7%	6%
HU			9%	
IE		22%		
IS	12%	13%		9%
IT	33%	34%	24%	22%
LUX				18%
NL	20%	16%	9%	10%
PL		11%	12%	
PT			8%	
SE	8%	7%	4%	4%
SL			5%	2%

RESULTS: FIRST STAGE ESTIMATES

	First-stage estimates	
	Informal care received	Contacts with children
Proportion of daughters	-0.113 (0.133)	0.434*** (0.080)
Proportion of daughters x Gender employment gap among children (country-wave level)	5.262*** (1.077)	-0.039 (0.645)
AP F-test of excluded instruments	29.18	23.55
Control variables included	yes	yes
Country-wave fixed effects	yes	yes
R ²	0.094	0.203
N	19,613	19,613

Source: SHARE. Note: Robust standard errors allowing for clustering at the individual level and the country-wave level are in parentheses. (*), (**), (***) mean that the coefficient estimate is significantly different from zero at the 10%, 5%, 1% levels, respectively.

RESULTS: REDUCED FORM AND TSLS ESTIMATES

	Cognitive test scores	
	Reduced form estimates	TSLS estimates
Informal care received per month (/10)		-0.111** (0.046)
Contacts with the children per month (/10)		0.152* (0.080)
Proportion of daughters	0.079** (0.032)	
Proportion of daughters x Gender employment gap among children (country-wave level)	-0.590*** (0.197)	
Control variables included	yes	yes
Country-wave fixed effects	yes	yes
R ²	0.299	
N	19,613	19,613

Source: SHARE. Note: Robust standard errors allowing for clustering at the individual level and the country-wave level are in parentheses. (*), (**), (***) mean that the coefficient estimate is significantly different from zero at the 10%, 5%, 1% levels, respectively.

RESULTS: REDUCED FORM AND TSLS ESTIMATES: WOMEN

	Cognitive test scores	
	Reduced form estimates	TSLS estimates
Informal care received per month (/10)		-0.140*** (0.046)
Contacts with the children per month (/10)		0.188** (0.087)
Proportion of daughters	0.129*** (0.038)	
Proportion of daughters x Gender employment gap among children (country-wave level)	-1.007*** (0.237)	
Control variables included	yes	yes
Country-wave fixed effects	yes	yes
R ²	0.314	
N	15,268	15,268

Source: SHARE. Note: Robust standard errors allowing for clustering at the individual level and the country-wave level are in parentheses. (*), (**), (***) mean that the coefficient estimate is significantly different from zero at the 10%, 5%, 1% levels, respectively. The AP F-test of excluded instruments for informal care is 32.90 and for contacts: 39.38

RESULTS: TSLS ESTIMATES BY COGNITIVE TEST: WOMEN

	Cognitive test scores		
	Immediate word recall	Delayed word recall	Word fluency test
Informal care received per month (/10)	-0.156*** (0.049)	-0.134*** (0.046)	-0.057 (0.040)
Contacts with the children per month (/10)	0.179** (0.085)	0.144 (0.091)	0.153** (0.066)
Control variables included	yes	yes	yes
Country-wave fixed effects	yes	yes	yes
N	15,268	15,268	15,268

Source: SHARE. Note: Robust standard errors allowing for clustering at the individual level and the country-wave level are in parentheses. (*), (**), (***) mean that the coefficient estimate is significantly different from zero at the 10%, 5%, 1% levels, respectively.

ROBUSTNESS CHECKS

- Similar results using all women (instead of only women living alone).
- Results robust to the exclusion of the health related control variables.
- No sizeable effects of the instruments on formal care, suggesting that the results found are not due to formal care.
- Similar results using the gender difference in employment rate of the 20-64 from Eurostat.
- Similar results using the number of sons and number of daughters, each interacted with labor force participation of sons and daughters respectively (at the country level).

LIMITATIONS

- One limitation of this study is that we do not identify the effect of formal care on cognitive functioning or mental health outcomes. It limits the scope for policy recommendations.
- We did several attempts to find a proper instrument but so far, none of them so far provides a first stage strong enough to warrant identification.
- Quality of care is not taken into account.

CONCLUSIONS

- In this paper we identify the causal effect of informal care and contacts from children on cognitive functioning of older parents living alone.
- We find that social interactions with the children has a positive effect on cognitive functioning of older parents while caregiving has a negative effect.

CONCLUSIONS

- Our study suggests that informal care for older parents have unintended negative effects on the care receiver, which may foster dependency and further increase the demand for long-term care leading to a vicious circle.
- Our results point toward the importance of providing adequate information to caregivers in order to provide care in an efficient way that minimizes its perverse consequences.
- Caregivers should be sensitive to the expectations of older people, and allow them sufficient challenges so they can maintain existing abilities and skills.