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:

$$C_{ict} = \beta_{0ct} + X_{ict}' \beta_1 + \beta_2 \, IC_{ict} + \beta_3 \, contacts_{ict} + \varepsilon_{ict}$$

- The parameter of interest β_2 and β_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

$$\textit{Structural equation}: C_{ict} = \beta_{0ct} + X_{ict}'\beta_1 + \beta_2\, IC_{ict} + \beta_3\, contacts_{ict} + \varepsilon_{ict}$$

$$\textit{First stage equation}: IC_i = \gamma_{0ct} + X_{ict}'\gamma_1 + \gamma_2\, share_{ict} + \gamma_3 share_{ict} difemp_{ct} + \nu_{ict}$$

$$\textit{First stage equation}: contacts_{ict} = \pi_{0ct} + X_{ict}'\pi_1 + \pi_2\, share_{ict} + \pi_3 share_{ict} difemp_{ct} + \upsilon_{ict}$$

$$\text{Re}\,\textit{duced form equation}: C_{ict} = \delta_{0ct} + X_i'\delta_1 + \delta_2\, share_{ict} + \delta_3 share_{ict} difemp_{ct} + \eta_{ict}$$

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

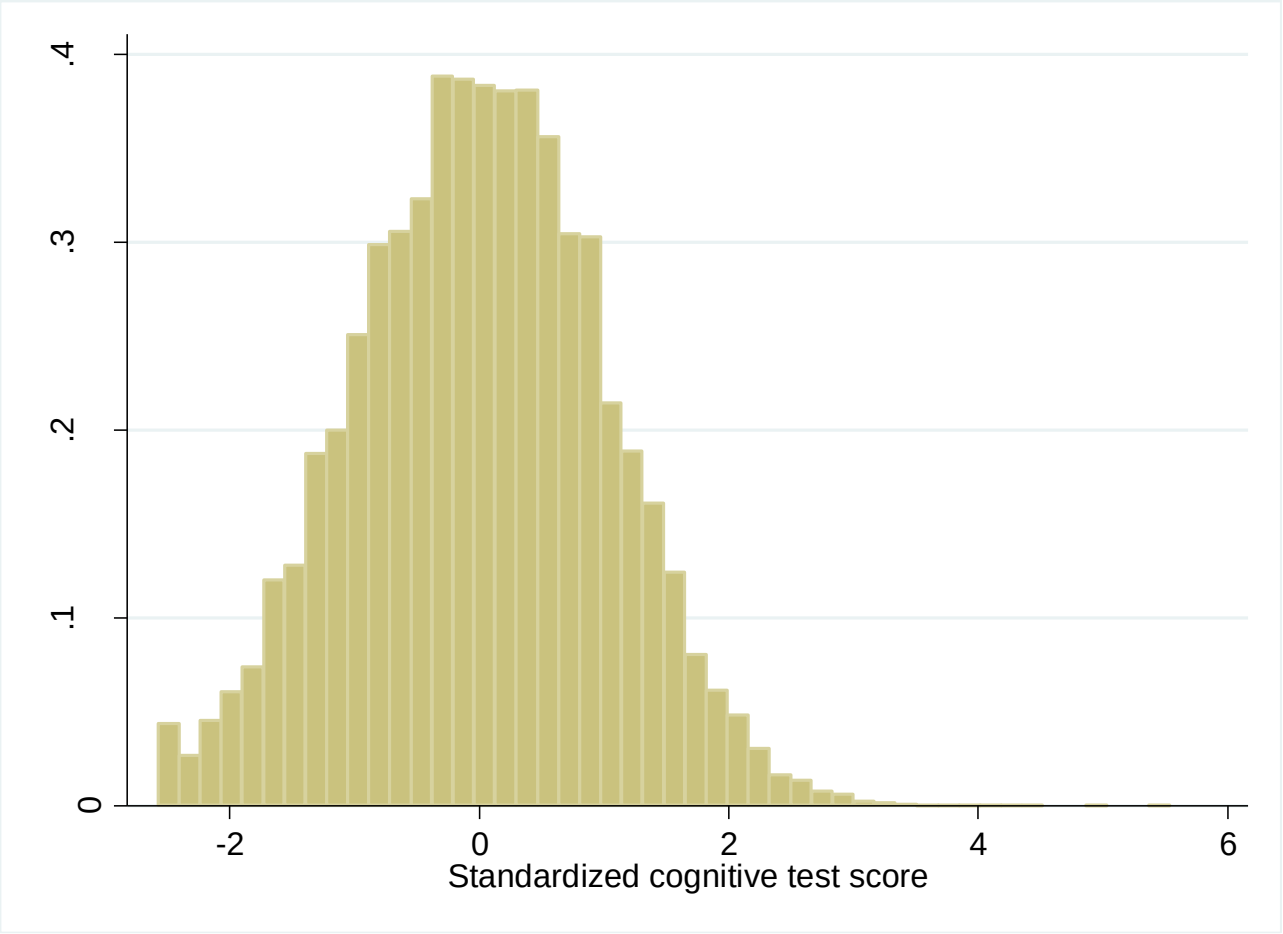
The cognitive tests in SHARE:

- **Episodic memory tests:** Tests of verbal learning and recall of a list of ten common words.
- **Executive skills test:** Test of how quickly participants can think of words from a particular category.

Index for cognitive functioning

- We use principal component analysis to combine those test scores into one general measure of cognitive skills.

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	0.434***
	(0.133)	(0.080)
Proportion of daughters x Gender employment gap among children (country-wave level)	5.262***	-0.039
	(1.077)	(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***	-0.134***	-0.057
	(0.049)	(0.046)	(0.040)
Contacts with the children per month (/10)	0.179**	0.144	0.153**
	(0.085)	(0.091)	(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.