



# Smarter every day

The deceleration of population ageing in terms of cognition

**Valeria Bordone**

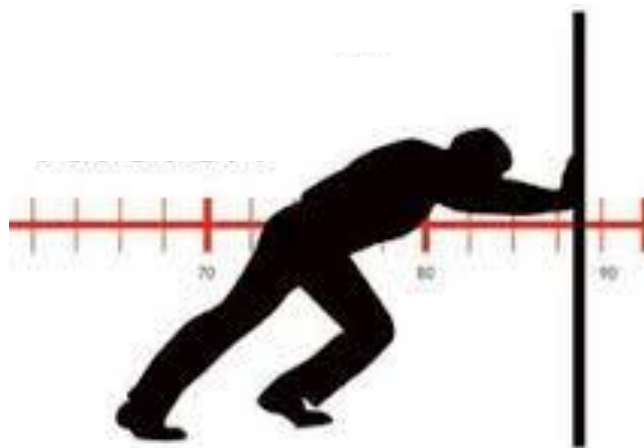
**Sergei Scherbov**

**Nadia Steiber**



# Ageing

- Increase in life expectancy
- Postponement of the onset of degenerative ageing (Vaupel 2010)



# Research question

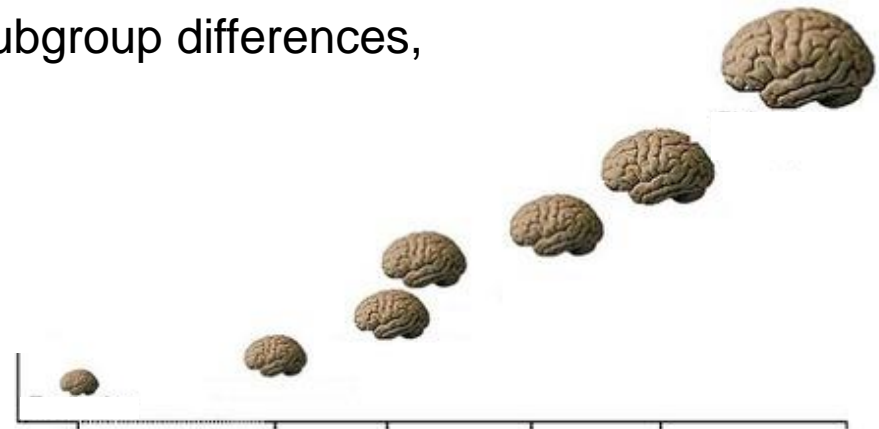
**Do we observe a deceleration of population ageing?**

- Cognitive functioning: useful measure of differential ageing



# The Flynn effect (FE)

- “Sustained upward drift in mean cognitive abilities” (Hiscock 2007)
  - Scant evidence on older populations (Baxendale 2010; Cristensen et al. 2013; Gerstorf et al. 2011; Rönnlund & Nilsson 2008; Rotrou et al. 2013; Skirbekk et al. 2013)
  - Little attention has been paid to subgroup differences, e.g. across education



# FE and education

- **Higher educated age later** (Christensen et al. 2009; Lièvre et al. 2008; Mäki et al. 2013; Sanderson & Scherbov 2014)
- Population ageing processes may decelerate also because of **“life-long learning”**



# Data and method (1)

- German Socio-Economic Panel 2006 & 2012
  - Age 50+
  - Symbol-Digit Task (SDT 30, 60, 90)

Interview Tabelle Tabelle

Welche Zahl gehört zu dem Zeichen?

÷ ) + † 7 V ( - †  
1 2 3 4 5 6 7 8 9

Zeichen: V

Zahl?

# Data and method (2)

- English Longitudinal Survey of Ageing 2002 & 2008\*  
 (\* refresher sample)
  - Age 50-74
  - Immediate (IR) & delayed (DR) verbal recall



- Animal Naming Task (ANT)



# Method

- Repeat cross-sectional approach
1. Estimate the difference in mean scores across waves
    - Controls: age, FE & education
    - By gender
  2. Test whether secular trends in cognitive function vary by age or education
  3. Identify subgroup differences in “constant characteristics ages” (CCA, Sanderson & Scherbov 2014)





# Estimate the difference in mean scores across waves

	Men	Women
	Control for age and education	Control for age and education
<b>SOEP</b>	<b>SDT90</b>	<b>SDT90</b>
<b>FE</b>	<b>2.496***</b>	<b>2.221***</b>
	(0.326)	(0.317)
<b>ELSA</b>	<b>ANT</b>	<b>ANT</b>
<b>FE</b>	<b>0.964***</b>	<b>0.824***</b>
	(0.248)	(0.217)

$FE > 0 \rightarrow$  Positive change in cognitive functioning between the two waves, net of age and education effects

# Identify subgroup differences in “constant characteristics ages”

AGE GAIN	Men	Women
SOEP	Control for age and education	Control for age and education
SDT30	5.2	4.6
SDT60	6.5	6.2
SDT90	8.2	7.7

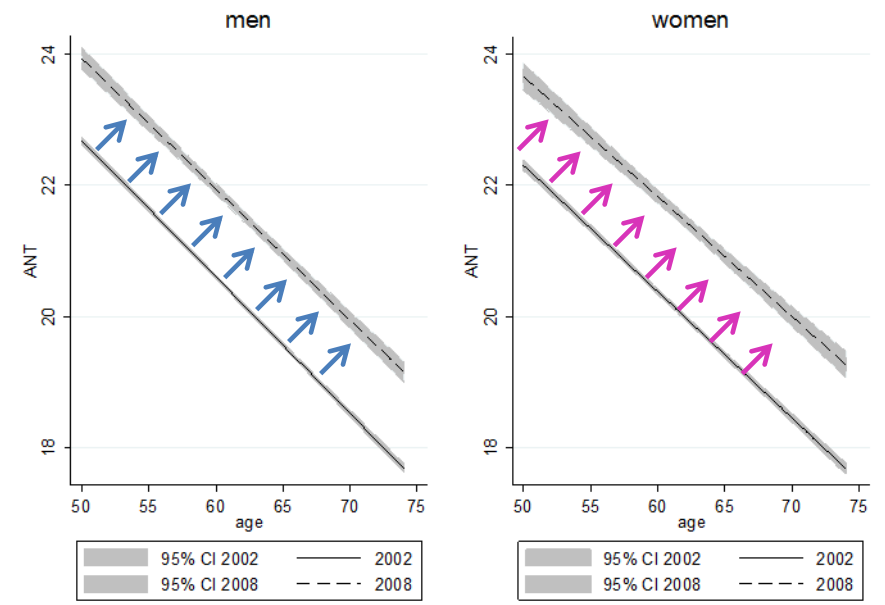
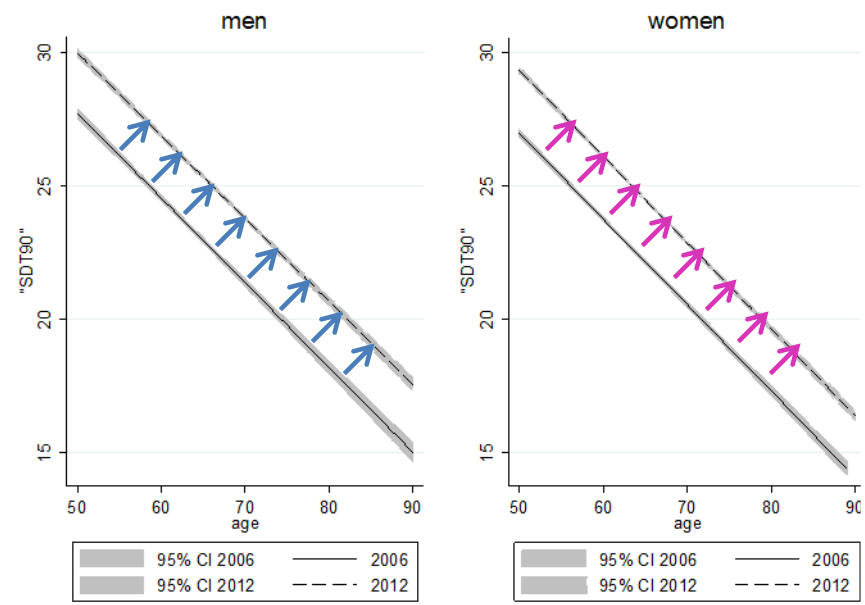
	Men	Women
ELSA	Control for age and education	Control for age and education
IR	5.2	3.9
DR	5.6	6.3
ANT	6.3	6.6

4 < AGE GAIN < 8 depending on gender and cognitive dimension

# The upward shift

## SDT 90, SOEP

## ANT, ELSA



# The role of technology

SOEP	Men		Women	
	2006	2012	2006	2012
PC in household	61.7%	72.6%	52.9%	65.2%
Mobile in household	82.1%	89.8%	75.5%	85.5%

ELSA	Men		Women	
	2002	2008	2002	2008
Uses PC	41.3%	65.9%	31.6%	58.8%
Has mobile	65.5%	82.9%	64.5%	89.1%



# The role of technology

AGE GAIN	Men		Women	
	Control for education	+ Computer & Mobile	Control for education	+ Computer & Mobile
<b>SOEP</b>				
<b>SDT30</b>	5.2	4.6	4.6	4.0
<b>SDT60</b>	6.5	6.0	6.2	5.8
<b>SDT90</b>	<b>8.2</b>	<b>8.0</b>	<b>7.7</b>	<b>7.5</b>
<b>ELSA</b>				
<b>IR</b>	5.2	3.1	3.9	1.6
<b>DR</b>	5.6	4.0	6.3	4.8
<b>ANT</b>	<b>6.3</b>	<b>4.6</b>	<b>6.6</b>	<b>4.1</b>

# Discussion

- Increasing average scores in cognitive functioning over successive cohorts
  - For different dimensions of cognitive functioning
  - For both men and women
  - Both in England and in Germany
- Flynn effect for the 50+, controlling for education
- Constant effect for every level of education
- Flynn effect more and more driven by informal forms of learning in everyday life.

thank you!

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