Use-it-or-lose-it?
Explaining age-related differences in key information processing skills
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A disturbing picture … for older people?

Predicted numeracy scores

![Graph showing predicted numeracy scores for older people.](image-url)
But positive effect for young people entirely due to education ...

Predicted numeracy scores, controlled for education

Results for medium educated people
... and it could be much worse for older people

Predicted numeracy scores, controlled for education and work experience

Results for medium educated people with no work experience
Research Questions

- Which factors determine skills accumulation?
- Which factors determine skills depreciation?
- Do these factors differ between younger (16-40) and older (41-65) people?
- What is the role of skill use ("use-it-or-lose-it" thesis)?
Accumulation Of Skills Over Life Course

• Formal learning: initial education has positive effect, especially for younger people.
• Non-formal learning: training has positive effect, especially for older people.
• Informal learning (1): work experience has positive effect, especially for younger people.
• Informal learning (2): voluntary work has positive effect, especially for older people.
Depreciation Of Skills Over Life Course

- Time since leaving education has negative effect, especially for younger people.
- Not working has negative effect, especially for older people.
- “Use-it-or-lose-it”: use of relevant skills prevents skill loss, especially for older people.
These Variables Also ‘explain’ The Age-effects

- Cognitive ageing: age has a negative effect, especially for older people.
- Partly determined by physiological factors (memory functions, health).
- Partly determined by previous variables: these determine the ‘policy space’.
Analyses

• Multivariate analyses (OLS): numeracy and literacy as dependent variables and previous variables as explanatory variables.

• Controlled for some background characteristics (gender, migrant, family background).

• Also look at changes in the age-effects after controlling for explanatory variables.

• General result: stronger effects for numeracy. These will be presented.
Education has very large effects; same for young and old
Small effects of training; no effect duration; larger for older
Some effect of work experience, especially for young
Small effect of voluntary work, especially for older people

- Young: Participation in voluntary work?
  - No: 0
  - Yes: 4

- Old: Participation in voluntary work?
  - No: 0
  - Yes: 5
Some effect of time out of education for young people
No Effect Of Not-working

- Only significant for young people’s numerical skills: loss of 2 points.
- Due to controls for skill use at work; people not working get the lowest score.
- Without controls, not-working does have the expected negative effect for older people.
Large Effects Of Skill Use At Home

**Graphs:**

- **Young**
  - **Skill use at home:**
    - Never: 0
    - Daily: 43

- **Old**
  - **Skill use at home:**
    - Never: 0
    - Daily: 42
Still Negative Age-effects Among Older People After Controls

- Remaining age-effect amounts to a loss of 0.5 points per year for older people.
- Due to cognitive ageing.
- Some of it related to poor health: 10 points loss, comparable to decline of 20 years of ageing.
Changing Age-effects After Controls

**Young**
- Only background: 0.772
- Plus health: 0.783
- Plus education: -0.204
- Plus training: -0.091
- Plus work experience: -0.606
- Plus depreciation: -0.01
- Plus skill use: -0.037

**Old**
- Only background: -0.695
- Plus health: -0.642
- Plus education: -0.478
- Plus training: -0.378
- Plus work experience: -0.742
- Plus depreciation: -0.573
- Plus skill use: -0.451
Use-it-or-lose-it? (1)

- Skill proficiency and skill use intricately connected.
- Causal direction?
- Additional analysis: compare currently working with those who stopped working in the past year.
- All other characteristics comparable: use of propensity score matching.
Method (1)
Method (2)
Use-it-or-lose-it? (2)

- Before matching: 20 points difference between the two groups.
- After matching: 5 points difference. People who are not working lose 5 points.
- This effect is comparable to effect of voluntary work.
- This seems an indication of “use-it-lose-it”.
Caveat

- Unobserved heterogeneity: matched pairs can still differ on unobservables.

- This cannot be excluded, but propensity score matching is still better than OLS.
General Conclusions

- Even after controlling for other variables, still negative age-effect for older people: cognitive ageing.
- Age-effects partly explained or suppressed by education, skill use, work experience and other variables.
- Effects stronger for numeracy than for literacy: literacy skills more loosely coupled to what people do or experience. Less room for policy interventions?
Factors In Order Of Importance

- Initial education
- Skill use at home
- Skill use at work
- Work experience, age (only older), and time since leaving education (only younger)
- Bad health, training and voluntary work
Use-it-or-lose-it?

- No claim on causality possible.
- Indications that use of skills is very relevant.
- Interestingly: use of skills at home MORE important than use of skills at work.
- Large variation in skills between persons and large effects of ‘manipulable’ variables: this indicates the ‘room’ for policy interventions.
THANK YOU FOR YOUR ATTENTION!