BILINGUALISM & COGNITIVE AGING

MARIA KATSIPERI¹, GEORGIA FOTIAĐOU¹, ELENI FLEVA¹ & IANTHI TSIMPLI¹.²

¹LANGUAGE DEVELOPMENT LAB, DEPT. OF THEORETICAL AND APPLIED LINGUISTICS, ARISTOTLE UNIVERSITY OF THESSALONIKI
²SCHOOL OF PSYCHOLOGY AND CLINICAL LANGUAGE SCIENCES, UNIVERSITY OF READING
Effect of Bilingualism across lifespan

The present study
  - Participants
  - Cognitive measures
  - Language measures

Conclusion
On the language domain
- Metalinguistic awareness (Cummins, 1978; Ter Kuile at al., 2010)
- Phonological awareness (Canbay, 2011)

On the cognitive domain
- Shifting abilities (Prior, 2010)
- Inhibitory control (Bialystok, 2005)
- Mental flexibility (Hommel, 2011)
- Working memory (Bialystok, 1994)
BILINGUALISM ACROSS LIFESPAN

- Bilingualism in aging is reported to contribute to:
  - better **cognitive control** (suppressing task-irrelevant information) (Bialystok et al., 2004)
  - maintaining the **white matter integrity** (Luk, 2011)
  - delaying the onset of Alzheimer's dementia up to 4.5 years (Bialystok, Craik, and Freedman, 2007; Alladi et al., 2013)
# THE PRESENT STUDY

## Participants

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aromanian-Greek bilinguals</td>
<td>27</td>
<td>65.2 yrs. Range: 55-65 SD: 6.6</td>
</tr>
<tr>
<td>Elder Greek monolinguals</td>
<td>27</td>
<td>65.4 yrs. Range: 54-82 SD: 6.3</td>
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<tr>
<td>Young Greek monolinguals</td>
<td>28</td>
<td>24.1 yrs. Range: 20-29 SD: 2.1</td>
</tr>
</tbody>
</table>
THE PRESENT STUDY

- **Aromanian:**
  - Romance language, typologically different from Greek
  - minority, low prestige
  - oral language

- **Bilingual Group**
  - Aromanian as L1
  - Active bilinguals

- **Elder monolinguals**
  - Age-matched
  - Education matched (in levels)

- **Young monolinguals**
  - Baseline
Cognitive tasks

• N-back (updating, inhibition)
• Global-local (shifting)
• Syntactic interference (working memory)

Linguistic tasks

• Anaphora resolution (an interface phenomenon) using eye-tracker technique
Updating: ‘two-back task’
(Kirchner, 1958)

Numbers appear for 500 msecs followed by a blank page which lasts 2500 msecs
Perceptual processing & Shifting: ‘local-global task’  
(modeled after St Clair-Thompson, 2005)

1. Indicate the number of lines needed to form the global figure
2. Indicate the number of lines needed to form the local figure
3. Now, alternate between global and local condition by yourselves
COGNITIVE MEASURES

Working Memory: ‘syntactic-interference task’
(Peristeri & Tsimpili, 2010)

Sentence-Picture Matching
“The lady washes the man”

Word Recall
umbrella
(4 consecutive words)
(1) Here is a hunter, a fisherman & a worker.
(2) The hunter meets the fisherman every afternoon in the forest by the river.  **(SVO)**- default
(2) The fisherman **him** meets the hunter every afternoon in the forest by the river.  **(OcIVS)**- marked
(3) **He (Aftos)** / **The same (O Idhios)** found accidentally there, after a long time, the worker.
**RESULTS**

- Significant differences on scores between the young and the older groups (mono & biling.)
- No significant difference between the groups on response times
RESULTS

- Significant differences between the young and the older groups (mono & biling.)
RESULTS

‘Syntactic-interference task’

- Significant differences between the young and the older groups (mono & biling.)
- Group x Antecedent: n.s.
- Main Effect of Anaphor Type across groups
- The same (idhios) => strong preference for subject BUT He (aftos) => ambiguous
RESULTS

non-target responses

- Old 2L1 > OldL1 > Young
- But no significantly
RESULTS

Mean RespTimes

- OclVs increased RTs across participants (F=4.352; p=.041)
- OclVS RTs > SVO among Old 2L1 ( F=5.781; p=.018)
Differences between OldL1 and Old2L1 in language performance but not in cognitive tasks may be due to:

a) protective effects of bilingualism on non-verbal cognition despite low prestige status and non-literacy variables for Aromanian and

b) the autonomous status of language in cognition