Multilingualism & language learning:
Exploring the boundaries, rethinking the extremes

Thomas H. Bak
University of Edinburgh
School of Philosophy, Psychology & Language Sciences (PPLS)
Centre for Cognitive Ageing & Cognitive Epidemiology (CCACE)
& Centre for Clinical Brain Sciences (CCBS)
@thbaketal
Environment:
- MRC Cognition & Brain Sciences Unit

Theoretical background:
- Neurodegeneration: a window into the human mind

The new challenges:
- The relationship between dementia & aphasia
- How to integrate cognition & motor functions
What is extreme?
Is it extreme to speak many languages?
Is it extreme to learn a language late in life?
Monolingualism as default

Monolingualism: clear, basic, simple
- \( \rightarrow \) natural

Multilingualism: complicating things
- \( \rightarrow \) in need of explanations

Bak & Alladi 2014, Future Neurology
Mehmedbegovic & Bak 2017, Eur J of Lang Policy
And the whole earth was of one language and one speech

Genesis 11, 1-9

(Kings James Bible)
Multilingual creation myths

North-West Arnhem Land (Northern Australia)

The ancestress **Warramurrungunji** after travelling under sea from Macassar, Indonesia, comes on shore and sets groups of people with their distinct land, food & language

*Evans 2006*
Has human language developed in a multilingual context?

- Multilingualism widespread among hunter/gatherers
- “Linguistic exogamy”
- Learning new languages across lifetime

- Multilingualism (including late language acquisition):
  - Natural state of human brain, mind & society
  - Natural form of mental exercise
From the claim of “bilingual advantage”
to the “deficit theory of monolingualism”

- Multilingualism as a natural form of mental exercise
- Monolingualism as a monoculture: efficient but deficient
- Monolingualism: a linguistic form of sedentary lifestyle?
- Compensation through other mental activities
One language or many?

The two narratives across ages & continents

Confusing individuals, destabilising societies versus Empowering individuals, enriching societies
“lack of definiteness in the meaning”

“confusion is carried over from the brain area connected with language to those connected with other functions”

“emotional conflict”, not relieved by the “cathartic play” reconciling the emotional world with the “reality principle”
Lambert & Peal 1962

- Context: “La révolution tranquille”
- Question: are bilinguals really worse?
- Study of intelligence in 10y. old
- Bilinguals outperform monolinguals on verbal & non-verbal intelligence
- Results spread only very slowly
From Montreal to Toronto...

- Context: Canadian multilingual policy towards immigrants
- "Meeting place" & "worlds’s ethnically most diverse city"

- Ellen Bialystok & her group @ York University

- 1990’s: Bilingualism in children:
  - Executive functions
  - Social cognition
  - Metalinguistic skills
Bilingualism & cognitive processes

- Exposure to different languages
  - => metalinguistic knowledge (spoken & written language)
- Language switching/mixing person/context dependent:
  - => theory of mind, perspective taking, social cognition
- Simultaneous activation of different languages:
  - => executive/attentional control mechanisms, switching

But bilingualism has also its price => slower lexical access
But for all of us who are not babies any more...

- Do bilingualism effects persist across the lifespan?

- Can they be due to language learning in later life?
Bak et al 2014, *Frontiers in Psychology*
Vega-Mendoza et al 2015 *Cognition*

- Using Test of Everyday Attention (TEA) “Elevator Task”
  - Early childhood bilingualism: better switching
  - Early adulthood bilingualism: better inhibition
  - No effects on visual-auditory divided attention

- Languages vs. humanities students
  - Year 1 (initial): No difference in switching
  - Year 4 (final) year: Significant difference in switching
Long et al, *under revision*

- Similar effects after an intensive language course?
- Improvement in switching after one week *(in all age groups)*
- Lasting 9 month later in those who practice >5hr/week

- The magic of Skye?
  - Non-residential course (Edinburgh), randomly assigned groups
  - TEA Switching Effects in Turkish, Norwegian
  - No effect in British Sign Language (BSL)
De Bruin et al 2015, *JML*
De Bruin et al 2016, *LNC*

- **People > 65 y:**
  - Gaelic: home/community, English: school/work
  - Later life: some use both, other only English

- **Active bilinguals:**
  - No difference: ToL & Simon Task, but on switching
  - Different baseline performance:
  - $\Rightarrow$ different strategy?
  - Longer reaction times in lexical access
Bialystok et al 2007, *Neuropsychologia*

- 230 dementia patients, ca. 50% bilingual
- Bilinguals develop dementia 4 years later!

- Related to contemporary research on bilingualism:
  - Bialystok et al 2004
  - Kavé et al 2008
  - Craik et al 2010

- The results interpreted in the light of **cognitive reserve**
Bialystok et al 2007:
- 230 dementia patients, 50% bilingual – dementia 4 years later
- BUT confounds: immigration, ethnicity, lifestyle etc

Why Hyderabad?
- Bilingualism common, old, not associated with migration
- Excellent clinical services, multilingual tests & staff

Results in 648 patients (60% bilingual)
- 4 years delay (6y. in illiterates!, n > 150)
- FTD > AD/VascD > DLB
193 patients with FTD (63% bilingual)
- Behavioural variant (bv) & progressive aphasias (SD & NFPA)
- FTD associated with a motor disorder: MND, PSP & CBD

Delay in the age of onset:
- Syndrome analysis: bvFTD vs. NFPA vs. SD: 5.7 vs. 0.7 vs. 0.5
- Symptom analysis: behavioural vs. aphasic: 6.1 vs. 0.3

Age of onset of Mild Cognitive Impairment (MCI):
- Bilingualism: 7.4 years
- Education: 3.6 years
Paplikar et al, *Aphasiology* 2018

- 608 stroke patients (58% bilingual)

- Difference in lifestyle/risk factors => later age of stroke
- Difference in cognitive reserve => different outcome

- Results: age at stroke: 56 vs. 56.5 years

- **Outcome:**
  - Normal cognition: 19.6% (Monolingual) vs. 40.4% (Bilingual)
  - Vasc Dementia/MCI: 68.7% (Monolingual) vs. 49.0% (Bilingual)
  - Aphasia: 11.8% (Monolingual) vs. 10.5% (Bilingual)
  - Global aphasia: 58.6% (Monolingual) vs. 17.9% (Bilingual)