

The Bilingual advantage: A reappraisal

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1939-2010



A pioneer in research on the dynamics of language contact

- Transference
- Code switching
- Longitudinal studies of migrant languages
- Language attrition

- Dedicated supporter of bilingualism
- Maintenance of minority and migrant languages
- Seminal work on language maintenance and attrition
- Early work on Dutch and German immigrants in Australia

The bilingual advantage

- What is it
- What causes it
- What proof is there

Bilinguals better drivers?

- Study by (Telner, Wiesenthal, Bialystok, & York, 2008) on the effect of bilingualism on (simulated) driving while doing tests through a hands-free mobile phone

- Bilinguals showed a 5% advantage in terms of safety in driving behavior
- No definition of bilingualism or other factors, like years of driving/miles/year

What is the BA

- In lay terms: bilinguals are better with respect to:
 - Creative thinking
 - Metalinguistic awareness
 - Logical thinking
 - Flexible in thinking
 - Better learners of the next language

Executive functions

- Special abilities that play a role in many types of behavior, in particular information processing.
- Bilinguals have these special abilities because they have to handle multiple languages all the time.

What are executive functions?

- 3 components: 'updating', 'inhibitory control' and 'task switching'
 - Updating: keeping and refreshing information in memory: number recall test
 - Inhibitory control: ability to ignore irrelevant information Stroop test, flanker test
 - Task switching: swift switching between tasks: Dimensional card sorting task; colour/ shape

Different populations

- Young early bilinguals (Age of onset 0-5)
- Young late bilinguals (Age of onset 6+)
- Young adults (typically university students)
- Healthy elderly
- Elderly with dementia

Time of onset of bilingualism and continuity

- Early onset /continuous use
- Late onset/continuous use
- Early onset/discontinuous use
- Late onset/ discontinuous use

- Most studies vague on continuous use and measurements of contact/use have low validity

Domain general and domain specific skills

- Are Efs domain specific or general?
- In other words: are the Efs only relevant for specific tasks or are they general?
- If they are specific, how are they related to general skills and conversely, how do domain specific skills contribute to domain general skills.
- How specific is specific: language skills?
Writing/reading listening/speaking equally effective and affected?

One or more BAs?

- Different components
- Different populations
- Different ages
- Differences in usage of L2
- Different causes

What evidence is there for a BA?

When can we say that there is a BA

- When on certain tasks there is a significant difference between bilinguals and a matched monolingual control group?
- But matching on what?

- When we can show that the difference between groups is causally related to specific aspects of language use?

There is a BA in younger, healthy populations

‘Results indicate that bilingualism is reliably associated with several cognitive outcomes, including increased attentional control,, working memory, metalinguistic awareness, and abstract and symbolic representation skills.’ (Adesope et al. (2010, 207)

There is an BA for children

- 'Together, these findings indicate that while exposure to a second language in a classroom setting may not be sufficient to engender changes in cognitive control, it can facilitate verbal memory and verbal learning. '

(Kaushanskaya et al. 2014, 564)

- There is a BA for low SES 5 year olds for go-no-go tasks

(Foy & Mann 2014)

There is a BA for aging and dementia

- Alladi et al (2013) : 648 patients with dementia, 391 were bilingual. 36% illiterate and found a 4.5 year delay in onset of dementia for bilinguals. The ba for illiterates was significantly higher than for literates. More than two languages had no additional effects

- Delayed the onset of symptoms of Alzheimer's Disease in bilingual elderly (Bialystok, Craik & Freedman, 2007).
- Freedman et al (2014) BA in both Canada and India for various tasks

Mixed results

- Costa et al. (2009)_overview: difference for congruent and non-congruent items
- Bialystok & Feng (2009)
- Coderre, E. L., Van Heuven, W. J., & Conklin, K. (2013).
- Marzecová, A., Bukowski, M., Correa, Á., Boros, M., Lupiáñez, J., & Wodniecka, Z. (2013).

- Effect of cognateness of languages (Houtzager et al 2014, 2015)
- Effect of language proficiency
- Individual differences in development
- Role of working memory

There is a no BA

- ‘Card sorting, Simon and metalinguistic judgment task (650, 557 and 354 participants respectively) reveal little support for a bilingual advantage.’ Gathercole et al. (2014, 236)
- Paap & Greenberg (2013): no effect of bilingualism on EFs, low correlations between tasks

- ‘The research findings testing for bilingual advantages in EP do not provide coherent and compelling support for the hypothesis that the bilingual experience causes improved EP’ (Hilchey & Klein 2011, 629).

- Valian (2015):
 - There is no BA and advantages for bilinguals result from other cognition stimulating factors.
 - There is a BA but we cannot disentangle it from other factors

Ways of saying things.....

‘For several years now, headlines around the world have been trumpeting the cognitive control advantages enjoyed by bilinguals. As the story goes, a lifetime of experience selecting between two competing languages leads to improvements in control that generalize beyond the domain of language. It even protects the brain from the untoward effects of aging.

Despite the wide adulation of this view, critical readers like me find the whole story to be an insufferable mixture of excessive claims and weak evidence.

•(Bruce Morton 2014, 929

How little is enough? The Groningen/Leiden Project on late bilinguals

Main research question:

Do children attending bilingual schools outperform children attending monolingual schools on EF and English language proficiency tasks?

Groningen/Leiden Project on late bilinguals

- Children in regular classes and in early foreign language learning classes
- Up to 2 hours of English a week
- Massive exposure to English input through media/games/music

Participants

- 323 Dutch children in the 5rd and 6th grade of primary education (M=9.5, SD=0.7 years).
With English instruction for at least ninety minutes a week from kindergarten onwards.
- 185 Dutch children who received no instruction in English (M=9.5, SD=0.7 years)

Materials

- Executive functions tasks:
 - General
 - Wisconsin card sorting
 - Raven's progressive matrices (abstract reasoning)
 - Inhibition Control
 - Flanker
 - Verbal and visual Go/NoGo
 - Task switching
 - Verbal and visual rule switch task
 - Memory task
 - Forward and backward verbal and visual memory span

- Language proficiency
 - Lexical proficiency in Dutch and English (Peabody)
 - English grammar (Test of Everyday Grammar).
- School background data:
 - Average final assessment scores (Cito test) -> considered a measure of how “good” a school is
- Child background data:
 - SES assessed with Family Affluence Scale
 - Amount of contact with English



Conclusions Stevenson et al.

- No differences between groups on nearly all EF tasks
- Children receiving bilingual education had greater English proficiency as expected
- No negative effect on L1 Dutch
- Maybe 90 min/week is not enough
- Maybe multilingual environment masks effects of instruction

Publication bias?

- Are studies that show a BA more likely to be published than studies that don't show an effect?
- -> yes (Gathercole et al. 2014, De Bruin et al 2014)
- De Bruin et al.: comparison between papers at conferences with positive/neutral/negative Bas
- 34% difference between positive and negative findings in terms of publications

Is there a citation bias?

Do we get the impression that there is a BA because that is reported in the literature?

Analysis of # of citations of publications

- Positive effect BA
- Mixed effects
- No or negative effects

of citations/years since publication starting 2013

Citation bias

effect	mean# publicatons	Mean # citations	Impact jpournals
+	22	24.5	3.21
+/--	21	19.0	3.22
-	6	15.3	2.66

- So there is not only a publication bias, but also a citation bias: positive results are more likely to be published and to be cited.
- Publication bias is a problem because it presents the wrong picture of a field.
- It keeps researchers who find something different than mainstream from publishing.

Is there a BA?

- It depends.....
- NO systematic analysis of all the factors that might play a role

Or

- Trying to isolate the BA as a factor is pointless since the interaction with other factors is what makes the BA

What causes the BA?

Language use as exercise

- Is there an additional cognitive cost for using more than one language?
- Doing something difficult takes effort, like learning to ride a bike or solving mathematical problems
- Using multiple languages is only effortfull when the extraction of utterances is laborous
- Does language use as exercise have to be a burden to have an effect
 - ‘it doesn’t work when it doesn’t hurt?’

Different for bilinguals?

- All language settings require monitoring due to changes in conversational partners, topics, shared knowledge/common ground.
- “In summary, fluent bilinguals have additional needs for monitoring, switching, and inhibitory control, but these unique requirements may not be substantial enough to generate group differences in cognitive control. “(Paap & Greenberg 2013, 255)

Language use as exercise

- But if experience is so crucial, why are elderly than slower than adults, since they had more exercise over the life span. And why would children have an advantage, since they have been using the languages for a relatively short period of time?
- Why should using multiple languages continue to be a burden when it is done all the time

The burden of Code switching

- CS as a main source of cognitive tasking
- But is there a basis for this?
 - Early studies on switching costs (Meuter & Allport 1999)
 - Task: naming with language cue
 - Small size effects: 70-120 ms
 - Many reasons why multilinguals slow down before switch

Mosca & Clahsen (submitted)

- Cued picture naming
- Thirty German native speakers - L2 learners of English
- 500 ms language cue-300 ms blanc-picture to be named
- RT for the L1 (741ms) faster than for the L2 (790ms)
- no significant for difference Preparation (769ms) vs. No-preparation (764ms)

- “These results indicate that the presence of preparation time strongly improved language switch performance to the extent that they became as fast as non-switch trials (i.e. language switching costs disappeared).”

- Are real switches completely unexpected?
- In normal settings outside laboratory 150 ms as found in switching experiments are meaningless
- Switching costs are largely an artifact of experimentation and irrelevant for everyday conversations

Bilingual Disadvantages?

- Bilinguals are slower in lexical decision (Ransdell & Fischler, 1989), semantic fluency (Gollan, Montoya & Werner, 2002).
- They have a smaller vocabulary (Mahon & Critchley 2006)
- Bilinguals are worse at solving simple mathematical problems (Jaretz 1987)
- How should a 150 ms increase in RTs be weighed against a 150 ms gain in the Simon test?

- How do we translate the Executive Functions effects to real life activities?
 - Are bilinguals less adequate in communication because they are slower in finding the right words?
 - Are bilinguals worse in reading because they are slower in recognizing words?
 - Or is this ‘much ado about nothing’?

- There are many advantages of bi/multilingualism, societal, educational and maybe also cognitive
- But we have to see this in perspective and weigh the advantages and disadvantages and see what matters for whom.

- Thank you for your attention
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