Why having two languages boosts a child's brain

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Presentation overview

- What do we know about bilingualism?
- What are the most common misconceptions about bilingualism?
- What are the effects of bilingualism on children’s brain and their general cognitive skills?
- Why is bilingualism important for maintaining minority languages?
- What can be done to encourage bilingualism/multilingualism in children?

Is bilingualism so “special”? 

- Bilingualism is perfectly normal in many places of the world, but not (yet) in our society.
- More international mobility leads to more bilingual/multilingual families.
- There is a growing need for information about how bilingualism works.

Linguistic diversity and bilingualism

- The survival of linguistic diversity depends on the transmission of languages from one generation to the next.
- Understanding and encouraging child bilingualism is an essential component of this process.
Lack of information and misconceptions

- Bilingualism is often surrounded by negative attitudes and misunderstandings.
- Negative attitudes and lack of correct information not only affect individual children’s chances to grow up bilingual but also make it harder to maintain minority languages.
- Doubts and insecurity are common even among people who have positive attitudes towards bilingualism.

Some common myths about bilingualism

- “BILINGUALISM CAUSES DELAYS IN THE CHILD’S COGNITIVE DEVELOPMENT”
- “BILINGUALISM LEADS TO LANGUAGE CONFUSION”
- “BILINGUALISM IS USEFUL ONLY IF BOTH LANGUAGES ARE USEFUL (I.E. IF THEY ARE WIDELY SPOKEN)”
- “BILINGUALISM IS ‘GENETIC’: IT HAPPENS SPONTANEOUSLY WHENEVER PARENTS ARE NATIVE SPEAKERS OF DIFFERENT LANGUAGES”

How does the child’s brain work?

- Children can acquire any language without any ‘effort’, just like learning to walk.
- Child bilingualism is different from adult second language learning: it happens spontaneously if the child has enough input, opportunity, motivation, and fun.
- The child’s brain can deal with two (or even more) languages.

Bilingualism = a lot more than two languages

- **Social** advantages (generally well known):
  - access to two cultures
  - more tolerance towards/interest in other cultures
  - future advantages in the job market
- **Linguistic** advantages (less known):
  - separation of form and meaning
  - enhanced language learning abilities
  - more precocious reading skills
- **Cognitive** advantages (generally unknown):
  - mental benefits: how children think and use their brain in many situations.
### Spontaneous knowledge about language

- Bilingual children ‘notice’ how language works.
- Having two different language systems makes the structure of language more salient and favours the child’s attention to its features.
- Because of their ‘implicit’ understanding of language, bilingual children find it easier to pick up other languages.

(Bialystok et al. 1988; Bialystok 2003; Werker et al 2009)

### Words

- For example, bilingual children have two words for the same object (e.g. *milo* and *apple* for 🍏) and can distinguish between forms and meanings.
- They understand the conventional relationship between objects in the real world and their labels.
- They find it easier to learn relations among words, i.e. accept that the same object can be both a DOG and an ANIMAL.

### Separating form and meaning

- Bilingual children are the same as monolinguals at saying that this sentence is ‘said in the wrong way’:
  
  Apples growed on trees
- Bilingual children are better than monolinguals at saying that this sentence is ‘said in the right way’:
  
  Apples grow on noses

### Sounds

- Bilingualism affects some key background components to literacy.
- Bilingual children tend to be more precocious readers especially if they learn two languages that are written alphabetically.
- Reading skills transfer across (similar) languages.
• Bilingual children find it easier to identify and recognize the sounds of the spoken language.
• Bilingual children acquiring alphabetic languages have an earlier understanding of the correspondence between letters and sounds.
• E.g. Which is the longest word?
  TRAIN      CATERPILLAR

• Bilingual children can distinguish between their two languages from the very beginning of their lives.
• Bilingual children follow a similar sequence of stages and milestones in each of the two languages as monolingual children.
  (Paradis & Genesee 1996; Petitto et al 2003)

Preschool bilingual children realise sooner than monolinguals that a printed word keeps the same meaning wherever it appears.

How do we study babies?
Studies with babies

• Very young bilingual babies can be shown to distinguish the sounds of the two languages they have been exposed to.
• They do this even when the two languages are very similar - e.g. Spanish and Catalan.

(Bosch & Sebastián Gallés 2003)

Language mixing

• Children generally don’t mix their languages (but they can do so deliberately and for fun!)
• Language mixing – when it occurs - is usually not a sign of linguistic confusion:
  – adult bilinguals do it too
  – children mix when they speak with other bilinguals, not when they speak to monolinguals
  – mixing is not random: it has a “grammar”

(Myers-Scotton 2006)

Grammar of code-mixing

• For example, a Spanish-English bilingual child might say

  ‘La house’

  but not

  ‘The casa’

(i.e. Spanish article + English noun, rather than English article + Spanish noun)

Awareness of other points of view

• Bilingual children understand at an earlier age that other people may have a different perspective from their own.

• This advantage comes from children’s constant experience of choosing a language on the basis of the person they talk to.
Example: adopting another person’s perspective

• Test: “A boy puts his chocolate in a cupboard and then leaves the room; during his absence his mother puts it in on top of the fridge. Where will the boy look for the chocolate when he returns to the room?”

• Three-year-old bilingual children are more likely to give the correct answer (‘in the cupboard’) than their monolingual peers. (Kovács & Mehler 2009)

Flexibility of reasoning

• The sun-moon problem: “Suppose everyone got together and decided to call the sun the moon and the moon the sun. What would be in the sky when we go to bed at night? (correct answer: the sun.) What would the sky look like at night? (correct answer: dark)

• Bilingual children solve this problem earlier than monolinguals because they are more likely to understand that only the names have changed.

Attention

Bilinguals tend to be better than monolinguals at:

• switching between tasks that require attention to different instructions
• focusing attention on specific features while ignoring other distracting features

These differences persist throughout life: they are found both in bilingual children and in adults who were raised bilingual from early childhood.

An example

• Switching between tasks:
  Task A: sorting objects by shape
  Task B: sorting objects by colour:

• Bilingual children are less likely than monolinguals to persevere with Task A when they are asked to perform in Task B.
Two groups of 7-month-old bilingual and monolingual babies get used to seeing a puppet appear on the left of a screen immediately after hearing some made-up words.

At some point both the words and the position of the puppet change.

All babies persist in looking at the side of the screen where the puppet appeared in the first condition, but...

Bilingual babies are faster than monolinguals at adapting to the new condition.

6-year old bilingual children are better than monolinguals at seeing both interpretation of ambiguous figures and at switching between them.

The two languages of bilinguals are always active.

Bilinguals have to ‘filter out’ one language when they speak the other.

They have massive practice of using a control mechanism that allows them to limit interference between their languages.

The same mechanism may be used in other activities that require controlled attention.
No effects on “intelligence”!

- Bilingual children are NOT “more intelligent” than monolingual children: they have an “extra gear” that can improve their performance in a wide range of situations.

Any pair of languages will do

- If the advantages of bilingualism are related to the switching from one language to the other, and inhibiting one language when the other one is spoken, they should happen regardless of WHICH languages bilingual children learn.
- This is another good reason for keeping active minority languages.

Are the benefits found only in children from privileged backgrounds?

The answer is no.
- Recent research on Spanish-English children from disadvantaged backgrounds in the US has shown that they perform better on control tasks than monolinguals.

Are the benefits found only in children from a particular culture?

The answer is no.
- Recent research on bilingual and monolingual children in Canada and India has shown that bilinguals in both these countries perform better on executive control tasks than monolinguals.
Some new studies suggest that bilingualism may offer some protection against the deterioration of cognitive abilities in old age.

Older bilinguals who develop dementia show symptoms up to 4 years later.

In non-pathological ageing, the level of maintenance of cognitive functions seems to be a function of the number of languages spoken in life.

(Kave et al 2008; Bialystok and Craik 2010)

Many parents in bilingual households think that it is better to wait to introduce one of the languages until the other one is ‘well established’.

This, however, deprives the child of language input in the most crucial years.

It is more difficult to introduce the other language later on and for the parents to use a ‘new’ language around the house.

The best ‘window of opportunity’ for becoming fully bilingual is early childhood.

But the good news is that….

…..exposure to another language in the primary school years is more likely to lead to bilingualism than in late adolescent/adult years.

Many studies (including our own research – Bak et al 2009) have found that child second language learners can also benefit from the cognitive advantages of bilingualism.
We examined 60 students from the University of Edinburgh, aged 19-34 years, divided into monolinguals (n=19) and bilinguals (n=41).

The bilingual group subdivided into those who acquired both their languages before the age of 3 years (n=22) and those who acquired the second language between the age of 4 and 15 years (n=19).

All did 3 tests of auditory attention of increasing complexity from Test of Everyday Attention (TEA, Robertson et al., 1994): counting simple tones (TEA 1, sustained attention), counting low as opposed to high tones (TEA 2, selective attention) and a counting reversal task (TEA 3, attentional switching).

All bilinguals better than monolinguals

No significant differences between early and late bilinguals

(Bak, Everington, Garvin & Sorace 2008)

Studies on older bilingual children show that if input continues to be offered in both languages, bilingual competence is maintained, even if one of the languages becomes stronger.

Minority languages that are heard often during childhood are not forgotten, even if they are not often spoken.

Some (but not all) bilingual children are ‘late talkers’, although they are still within normal bounds.

Bilingual children have two vocabularies: all other things being equal, the size of vocabulary in each language is smaller than in monolinguals, especially in the first few years (although the global size of their mental vocabulary in the two languages may be in fact larger).

This is a small price to pay compared to the linguistic and cognitive benefits of bilingualism!
Being committed to bilingualism: planning, opportunities, motivation

• Being native speakers of different languages is not sufficient to make bilingualism work.
• Children need to **hear enough of both languages.**
• This takes some commitment and consistency.

How children perceive the minority language is important

• Children are very sensitive to people’s attitudes towards language: they know whether a language is considered ‘unimportant’.
• Children need to realise that
  – both languages and cultures are valued by the family and the community.
  – both languages can be used in all situations and are spoken by many people outside the family.

So to conclude....

• Bilingualism is an investment for life that gives a child much more than two languages.
• There are (at least) **four good reasons to maintain minority languages and encourage early bilingualism in all children.**

Four advantages

• Bilingual children:
  – **have enhanced metalinguistic abilities and reading skills,**
  – **learn other languages more easily,**
  – **have an enhanced awareness of other points of view,**
  – **have enhanced attention abilities and are better able to deal with complexity.**

• The benefits of bilingualism continue to be maintained across the life span, from childhood to old age.
Why information is important

- If families, teachers, health professional and policy makers have the correct information about the advantages of bilingualism, more and more children to grow up with two languages.

Awareness of the benefits of bilingualism can help to...

- exploit (or create) opportunities to raise children bilingual from early childhood.
- invest more resources in language learning both in the pre-school and in the primary school years.
- recognize that languages spoken by children of immigrant families are a rich resource and not an obstacle.
- maintain minority languages through child bilingualism.

A recent initiative: Bilingualism Matters

- Partly funded by the Knowledge Transfer Office of the University of Edinburgh.
- Initially awarded funding from the UK Economic and Social Research Council.
- Supported by the European Community through "Piccolingo", a new initiative aimed to raise awareness of the importance of early second language learning.

Bilingualism Matters: what does this service provide?

- A website containing:
  - FAQs (now in 12 languages)
  - Local resources
  - Current events: talks, workshops, etc.
  - General audience references (books, articles and web-based resources)
- Free talks in the community; information workshops for institutions, businesses, and other organizations.
- Email replies to requests for advice and information.
• Bilingualism Matters is rapidly expanding outside Scotland and the UK.
• It is reaching more and more parents at all levels, teachers in kindergartens, primary and secondary schools, health professionals, policy makers.
• This success shows that there is wide scope for similar initiatives that bridge the gap between research on bilingualism and society.

We welcome feedback and suggestions!
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THANK YOU!