



# Bilingualism: A Cognitive Superpower

Maia Busi

Department of Psychology, Sociology, and Public Health, Lindenwood University



## Critical Period Hypothesis

- ❖ Lenneberg's Critical Period Hypothesis states that there is a time frame in which people can attain language, beginning in infancy and ending at the onset of puberty (as cited in Johnson & Newport, 1989).
- ❖ A critical period may apply to the acquisition of a second language (L2); L2 acquisition is more efficient at a younger age (Hakuta et al., 2003)

## L2 Acquisition

- ❖ **Compound Bilingualism:** Concurrent development of two languages within the critical period where codes (words) in each language that mean the same thing are stored together (Moradi, 2014).
- ❖ **Coordinate Bilingualism:** L2 is learned later in life separate from the first language and codes from each language are stored separately and not linked by their meaning (Moradi, 2014).
- ❖ **Sub-coordinate Bilingualism:** Second language is learned later in life by filtering it through the native language (Moradi, 2014).

## English Language Learners (ELL)

- ❖ ELL can take 4-7 years to acquire the language skills needed in classrooms and academic settings (Cigdem, 2017). Whereas 11% of ELL (grades 3-8) met or exceeded the mathematics proficiency standards, only 2.6% of them met or exceeded English Language Arts proficiency standards (Cigdem, 2017).
- ❖ ELL in the U.S. typically underperform due to social factors such as feeling unaccepted or unwelcomed in their school community, and a lack of instructor practices specified for ELL students (Janzen, 2008). High school completion rate in 2011-2012 was 80% for the general population, but only 59% for ELL (Jimerson et al., 2016).

## Cognitive Advantages

### Cognitive Flexibility & Code Switching

- ❖ Sara and Ghonsooly (2018) showed better scores on a cognitive flexibility task among advanced foreign language learners compared to beginner-level foreign language learners. This provides evidence of a strong ability to cognitively adapt among people who are bilingual.
- ❖ Bilingual individuals regularly show their cognitive flexibility by utilizing code-switching. Code-switching involves switching between languages or inserting codes from one language into the other (Green & Wei, 2016).

### Executive Function (EF)

- ❖ Tran et al. (2019) found an advantage among bilingual participants in an EF task that involved a card sorting task involving dimensional shifting (for example colour and then shape), a process that parallels code-switching processes.
- ❖ Hartanto and Yang (2020) found that bilingual individuals with a higher level of dual-language exposure exhibited better task-switching abilities and that code-switching positively impacted their inhibitory control.

### Working Memory (WM)

- ❖ There are WM advantages among bilingual people specifically in memory processing and integration mechanisms (Blom et al., 2014).
- ❖ Blom et al. (2014) found that bilingual children exhibited advantages in reverse processing tasks and tasks that rely on visuospatial WM suggesting that bilingual individuals can more efficiently retrieve, and process information stored in their memory. This bilingual advantage becomes more prominent as age increases (Blom et al., 2014).

### Delay of Cognitive Decline

- ❖ Woumans et al. (2015) revealed a 4.6-year delay in the onset of Alzheimer's symptoms among bilingual individuals compared to monolingual individuals.

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