

The Effect of Simultaneous Interpreting on Age-Related Changes of Executive Functions Across Lifespan

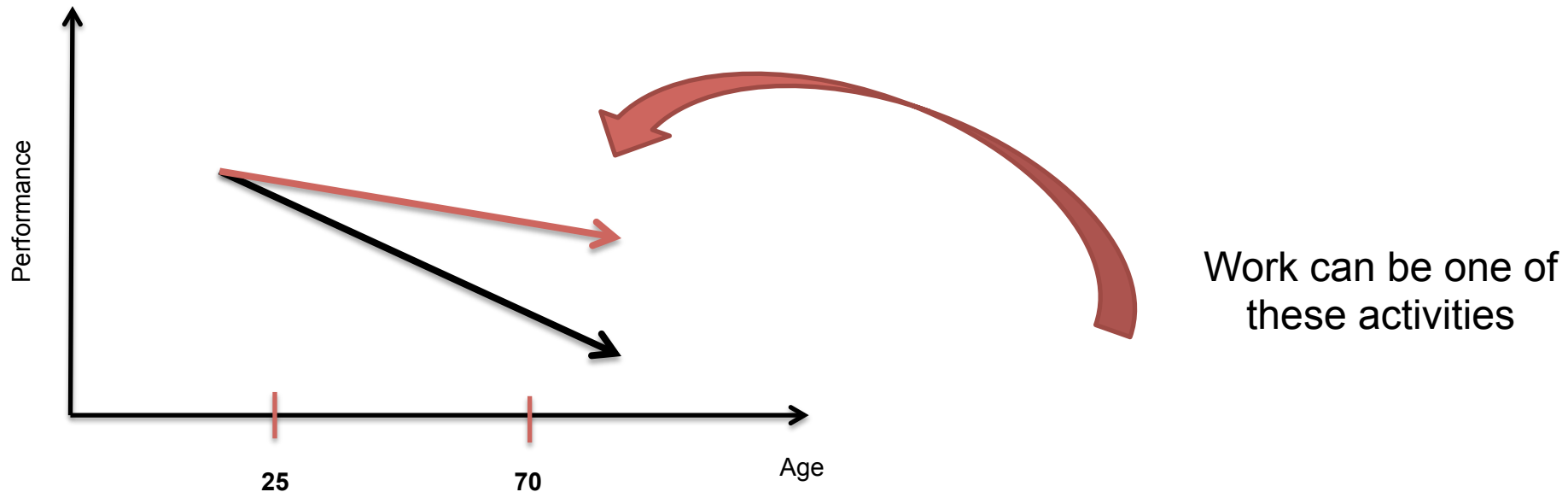
ESN 2015 – Tampere , Finland

Sébastien Henrard & Agnès Van Daele
UMONS / FPSE – Work Psychology Unit
sebastien.henrard@umons.ac.be

UMONS
Université de Mons

Introduction

With advancing age, cognitive functions decline



But different activities can slow the decline of cognitive functions and delay the symptoms of neurodegenerative diseases

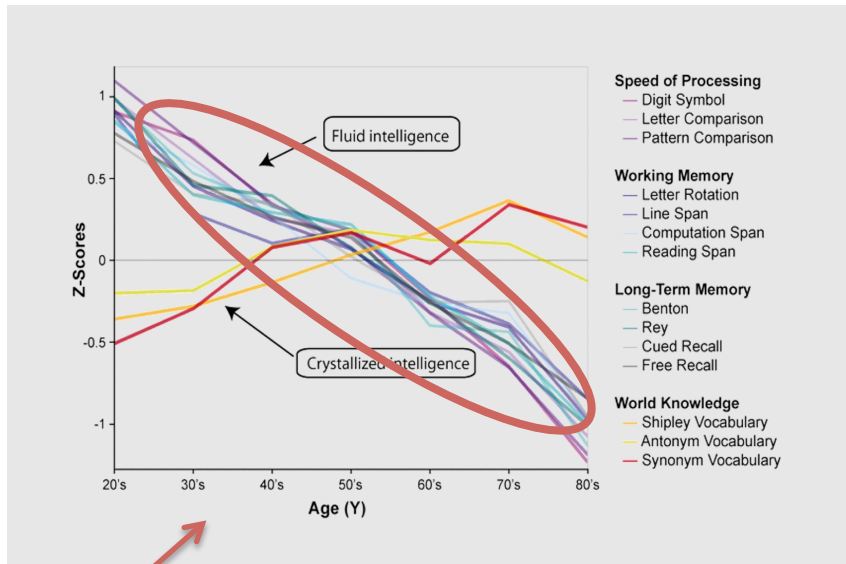
Introduction

- Recent studies showed that an experience in a work activity can modify the brain.
 - ➔ Modification of the size of hippocampus in taxi drivers (Maguire et al., 2000; 2003 ; 2006 ; 2011).
 - ➔ Modification of the gray matter volume in professional musicians compared to non musicians (Gaser & Schlaug, 2003).
- Other studies showed that experience in a work activity can preserve cognitive functions from declining
 - ➔ Higher mental stimulation at work is associated with improved cognitive functioning and a slowing cognitive decline (Marquié et al., 2010).

Introduction

Based on this research, we are interested in the influence that a specific work activity can have on executive functions.

Why executive functions ?



Park et al., 2001

Simultaneous Interpretation



Inhibition

Flexibility

Updating

Speed

Multitasking

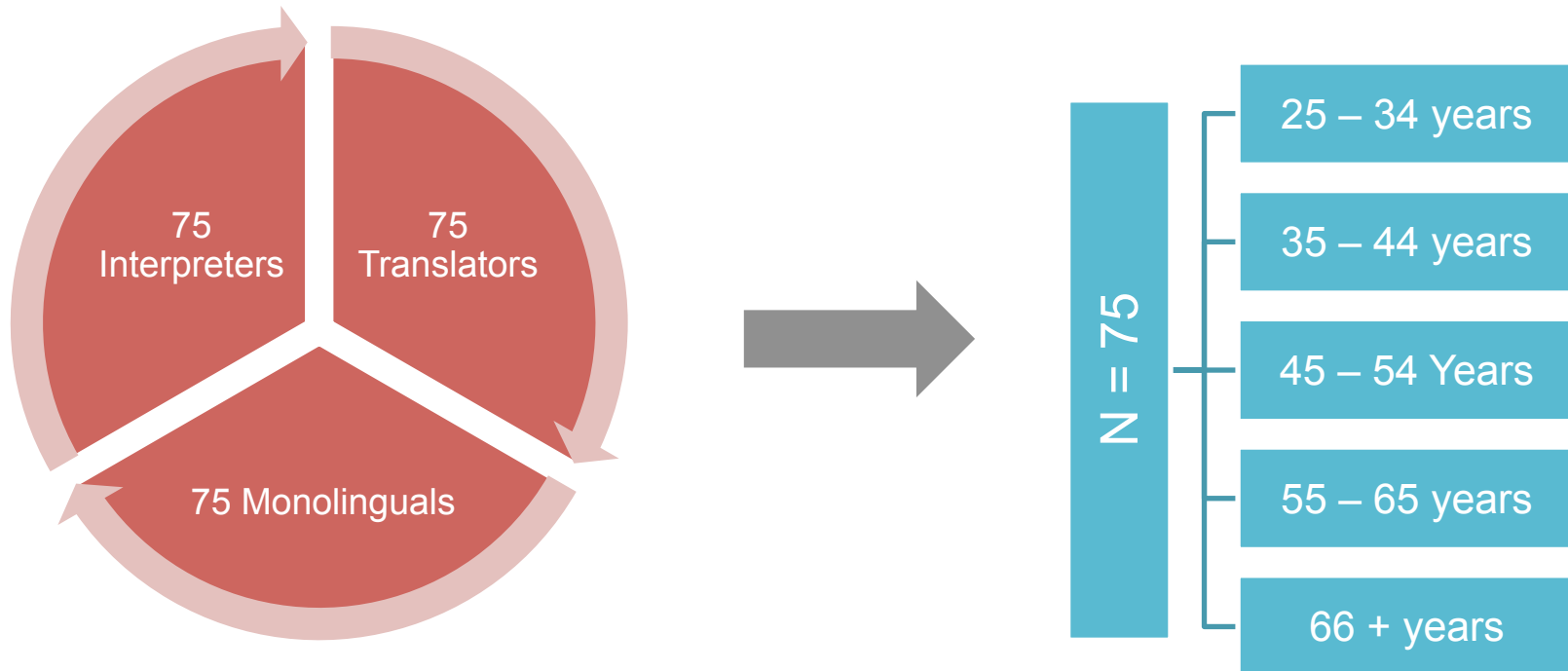
Objective and Hypothesis

- **Final objective :**
 - To show that a cognitively demanding work activity helps prevent the natural decline of cognitive functions.
- **Hypothesis**
 - H1 : The functions intensively and frequently involved in a work activity can be preserved from the natural cognitive decline.
 - H2 : In the case of simultaneous interpreters, the functions and processes related to executive control should show a smaller decline than for non interpreters.

Participants

225 participants divided into three groups


5 age groups of 15 participants each
(25–34 ; 35–44 ; 45–54 ; 55–65 ; 66+)



Statistically comparable for gender, level of education, age and experience.

Methods

- 5 computerized tasks presented randomly
- These tasks were selected to evaluate the cognitive processes and functions essential to the simultaneous interpretation activity.
 - Simple reaction time
 - Dual task (Brown Peterson)
 - 3 tasks assessing executive functions (updating, inhibition, flexibility) from the model of Miyake et al.(2000)



Letter memory for
updating

Antissaccade for
inhibition

Plus-Minus for
flexibility

Results

Reaction Time

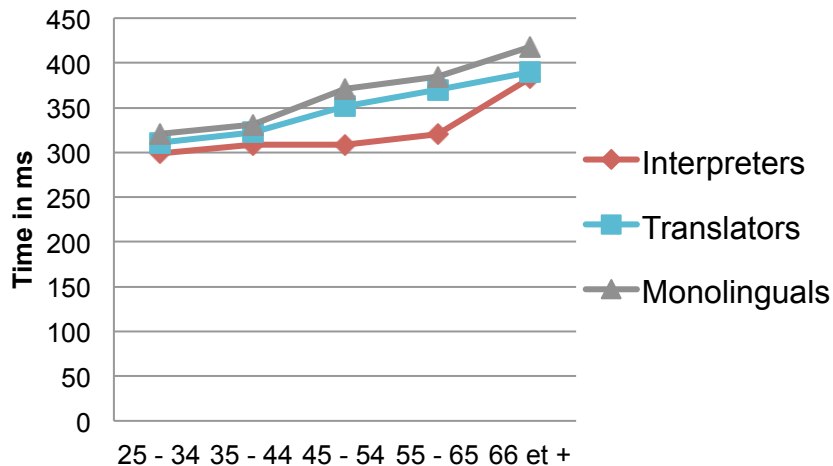


Table 1. Results – Reaction Time

	25-34 (n= 45)	35-44 (n = 45)	45-54 (n=45)	55-65 (n=45)	66+ (n=45)
Int / Trans	NS	NS	.009*	.001*	NS
Int / Mono	NS	.041*	.001*	.001*	.029*
Trans /Mono	NS	NS	NS	NS	NS

35 years : Difference between interpreters and monolinguals

45 years : Differences between interpreters and the two other groups

66 + : Difference between interpreters and monolinguals

Results

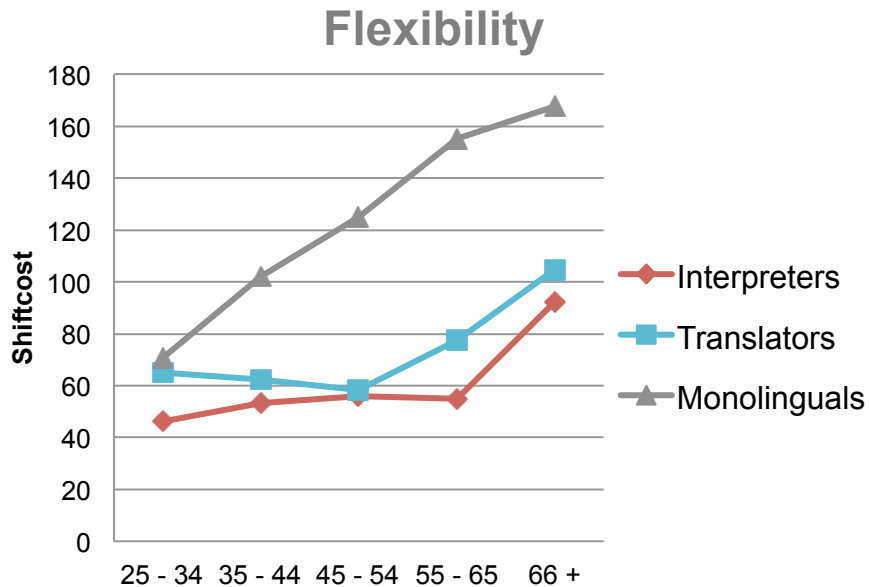


Table 2. Results – Flexibility

	25-34 (n= 45)	35-44 (n = 45)	45-54 (n=45)	55-65 (n=45)	66+ (n=45)
Int / Trans	NS	NS	NS	NS	NS
Int / Mono	NS	.033*	.027*	.003*	.004*
Trans /Mono	NS	NS	.034*	.029*	.019*

No differences between interpreters and translators

35 years : Difference between interpreters and monolinguals

45 years : Differences between interpreters/translators and monolinguals

Results

Updating

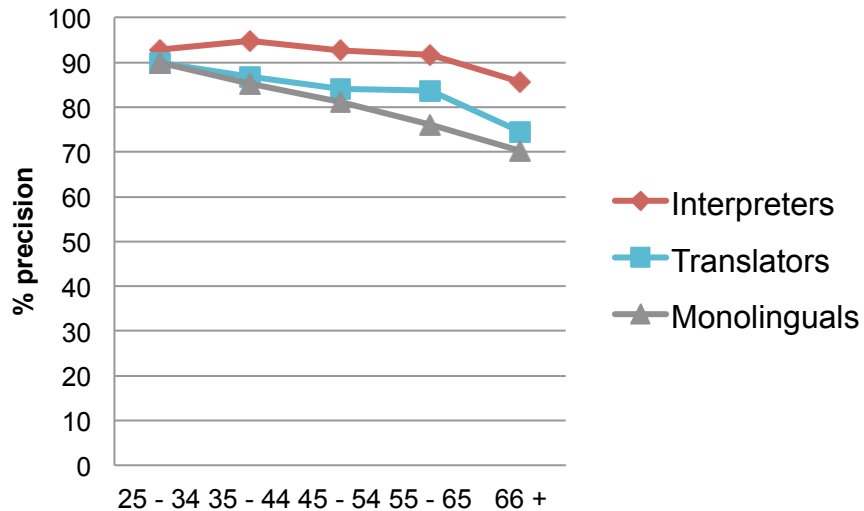


Table 3. Results – Updating

	25-34 (n= 45)	35-44 (n = 45)	45-54 (n=45)	55-65 (n=45)	66+ (n=45)
Int / Trans	NS	.015*	.016*	.048*	NS
Int / Mono	NS	.003*	.001*	.001*	.004*
Trans /Mono	NS	NS	NS	NS	NS

35 years : Differences between interpreters and the two other groups

66 + : Difference between interpreters and monolinguals

Results

Inhibition

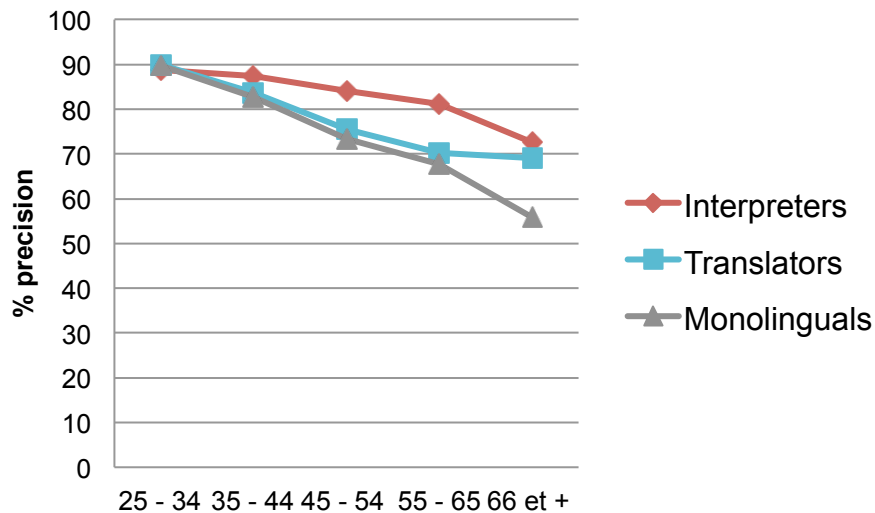


Table 4. Results – Inhibition

	25-34 (n= 45)	35-44 (n = 45)	45-54 (n=45)	55-65 (n=45)	66+ (n=45)
Int / Trans	NS	NS	NS	NS	NS
Int / Mono	NS	NS	NS	.014*	.008*
Trans /Mono	NS	NS	NS	NS	.049*

No differences between interpreters and translators

55 years : Difference between interpreters and monolinguals

66+ : Differences between interpreters/translators and monolinguals

Results

Dual Task

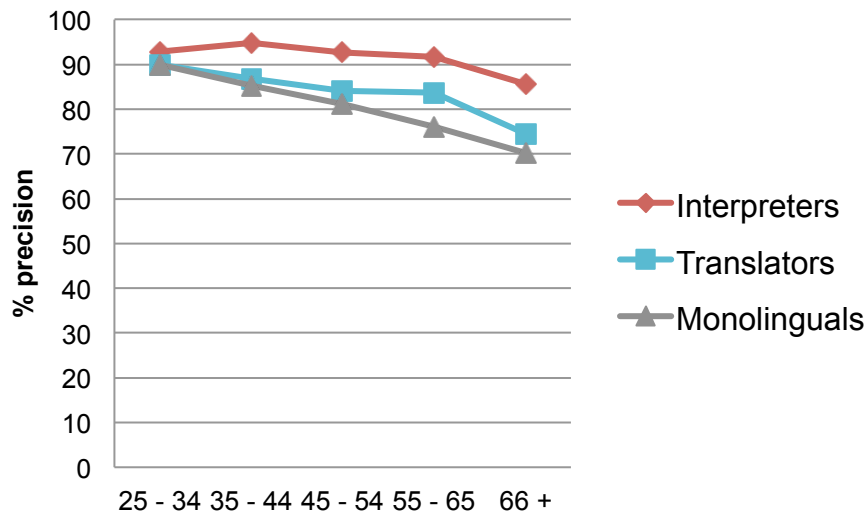


Table 5. Results – Dual Task

	25-34 (n= 45)	35-44 (n = 45)	45-54 (n=45)	55-65 (n=45)	66+ (n=45)
Int / Trans	NS	NS	NS	NS	NS
Int / Mono	NS	.042*	.008*	.001*	NS
Trans /Mono	NS	NS	NS	.002*	NS

No differences between interpreters and translators

35 years : Difference between interpreters and monolinguals

55 years : Differences between interpreters/translators and monolinguals

66 + : No differences between groups

Results - Summary



No differences between groups

Differences between interpreters and monolinguals in updating, flexibility, dual tasks and RT

Difference between interpreters and translators in updating

Difference between interpreters and translators in RT

Difference between translators and monolinguals in flexibility

Difference between interpreters and monolinguals in inhibition

Difference between translators and monolinguals in dual task

Difference between translators and monolinguals in inhibition

The differences between interpreters and translators in updating and RT disappear

Discussion

- Over a working life, it seems that simultaneous interpreting may slow the decline of executive functions.
 - ➔ The stimulation during work activity preserves the most involved functions in simultaneous interpreting (Speed of information processing and Updating).
- However, once retired, interpreters seem to lose the benefits of cognitive stimulation of their work activity even if the benefits of bilingualism are preserved (better inhibition and flexibility than monolinguals).
 - ➔ The decline of cognitive stimulation related to retiring causes the loss of the benefits acquired by work.

Thanks for your attention

