

Presentation DPL- Colloquium

Title:

New Languages and Old Brains: *La Mise en Place*

Abstract:

The unprecedented growth in the number of older adults in Switzerland and elsewhere calls for measures to stave off the age-related cognitive decline, and contribute to healthy and active aging. Second language (L2) learning is a promising way of achieving both, being a cognitively challenging activity that has been shown to promote neural plasticity, and to foster social interactions and individual mobility. However, research on L2 learning and senescence is only beginning to establish itself, and the relationship between cognitive capacities, the aging brain, motivational aspects and L2 learning in third age is largely unknown.

In a pilot study to this project, we could show that cognition – that is, working memory and verbal fluency, in particular – predicted the L2 development of (Swiss-) German adults (65-75 years) learning English as a foreign language for a total of 60 hours. Further, functional differences in the brain at rest *before* the training, as measured with the electroencephalogram (EEG), as well as motivational differences during the training were predictive of the learning outcome. However, this previous study used two time points only (before and after the training), which restricts the analysis to linear statistics and is hardly representative of the learning curve observed during foreign language acquisition. In line with the Dynamic Systems Theory (Larsen-Freeman & Cameron, 2008), the L2 development itself as well as its dependence on factors other than the training are likely to differ between the respective learning phases.

Thus, in the current project, older adults between 65 to 75 years of age will participate in a 30-weeks multimodal Spanish training, combining computerised training and communicative language sessions. Before, during and after the training, we will collect data on the participants' L2 skills, cognitive capacities, socio-affective factors as well as electrophysiology (EEG). We will do so on a weekly basis, which allows us to analyse individual learning trajectories in great detail later on. The cognitive performance of this group of L2 learners will then be compared against an active and a passive control group. By doing so, we aim to answer 1) when L2 development in older learners is significantly increasing, 2) whether cognition, electrophysiology and socio-affective factors can predict the learning outcome and 3) how the impact of L2 learning on cognitive trajectories compares to that of other training types.

This project is an interdisciplinary undertaking between cognitive neurosciences, romance linguistics, SLA, psychology and psycholinguistics and is supervised by Prof. Stark (UZH), Prof. Meyer (UZH), Prof. Pfenninger (University of Salzburg) and Prof. Dellwo (UZH).

Currently, we are doing the *mise-en-place* for the data collection, which is due to start in October 2018:

- The project has been submitted to the Ethics Committee of the Zurich
- Together with an intern, we are currently finishing the programming of the cognitive tests in Python.
- The recruitment documents (flyers, study information, etc.) and procedures (guidelines for interns and MA students) are in place and are currently being distributed.
- The manual for the language learning software is ready to be piloted.
- The logistics of the project are being organised with the IT department and the Auditorium Services of the UZH.
- The project website is being set up by Sascha Völlmin.

The next steps are:

- Developing the language tests in accordance with the Salzburg group conducting a similar study using English as the target language;
- Piloting cognitive and linguistic tests with a handful of older adults to ensure the tests' feasibility and to assess the time required to perform them;
- Recruiting suitable participants;
- Conducting screening tests to ensure that participants meet all the inclusion criteria;

- Conceptualizing communicative sessions (done by MA student of Spanish).

The difficulties we are currently facing are:

- Recruiting participants;
- Deciding on suitable stimuli/target structures for language tests:
 - o CEG (test de comprensión de estructuras gramaticales)
 - o Odd-one-out.

Project Phase	2018	2019	2020	2021
Phase I - Study preparation				
Consulting the Ethics Committee	x			
Training in data collection procedures	x x			
Setting up homepage	x			
Recruiting participants	x x x			
Finalizing test materials	x x x			
Preparing info material for study participation	x			
Preparing manual for use of Duolingo software	x			
Preparing manual for use of Rise-of-Nations game software		x		
Conceptualizing lesson plan for communicative sessions		x x		
Milestone: Study preparation and subject recruitment completed				
Phase II - Data retrieval:				
Data collection (language groups)		x x x		
Data collection (active control)		x x x		
Data collection (passive control)		x x x		
Milestone: Data collection finalized				
Phase III - Data entry and organization				
Transcription of oral data		x x x x		
Organization of data into database		x x		
Methodological training at University of Salzburg			x x	
Analysis and write-up of first results		x x	x x x	
Milestone: Presentation and write-up of preliminary results				
Phase IV - Analysis				
Analysis of results			x x x x	
Comparison of results with other international studies			x x x	
Write-up for international publications and conferences				x x x x
Milestone: Two articles published, PhD thesis completed.				