



Middle European  
interdisciplinary  
master's programme in  
Cognitive Science

## MEi:CogSci Learning Contract for the Mobility Semester



Erasmus+

### 1 Student Information

Student name	Finta, Klára Enikő
Home University	University of Vienna, Austria
Student ID Number (Home University)	12204291
Degree Programme Code (Home University)	UA 066 013
Host University	University of Ljubljana

This learning contract ensures that the ECTS credits the MEi:CogSci-student acquires at the host university will be recognised at the home university. In order to make this contract valid, please follow the procedure below:

#### A) Preparation phase

1. **Planning of studies and courses at the host university:** Student fills out the semester contract in negotiation with local coordinator.
2. **Negotiation of Special Topic of Interest Module(s)/Mobility Project:** The student negotiates the *special topic of interest* (i.e., a cognitive phenomenon) they want to study and how (i.e., a combination of courses, lab work, self-study, literature used) with the supervisor.
3. **Concrete plan of the project:** The student specifies the work-plan for the module (elements of module, milestones, deliverables, dates,...).
4. **Acknowledgement:** The supervisor checks the contract and gives their OK;
  - a. The **student sends the LC to the local coordinators at the home and host university** (+ cc to the supervisor)
    - i. with the agreement sentence: "I agree to this learning contract"
    - ii. as a **.pdf only**
    - iii. adding their name to the title of the document, e.g. **SurnameName\_LC\_Mobility**
    - iv. with an email head of this format only: LC\_ < student surname, first name> \_ <supervisor surname>
  - b. **Supervisor acknowledges that they accept the proposal by replying to the email (reply to all).**
5. **Approval by the home university:** The local coordinator at the home university approves it or requests changes (go back to step 2)

#### B) Mobility phase

6. **In case of changes in project/planned courses:** the student has to inform the coordinators at the host and home universities immediately.
7. After finishing the project, the supervisor grades, signs and stamps the document.
8. Graded, signed and stamped Learning Contract is sent to the coordinator of the host university **within the specified deadline**.

#### C) Grading & recognition phase

8. **Final grading & recognition:** Original signed contract & certificates/transcripts are returned to coordinator at home university for grade recognition after the project has been finished.

## 2 Semester Contract

S-I-CS New Trends in Cognitive Science Module: 10 ECTS				
Course Title	Course Type	ECTS	Grade (host)	Grade (home)
Trends in Cognitive Science	Lecture, seminar, journal club	10		
Module Grade				

S-I-PJ Special Topic of Interest (Project) Module: 15 ECTS				
Project Title	Supervisor	ECTS	Grade (host)	Grade (home)
Language processing in healthy and brain-damaged populations: neurolinguistic analysis of data from people living with Multiple Sclerosis	Christina Manouilidou, assoc. prof. (Faculty of Arts, Department of Comparative and General Linguistics)	15		
Course Title	Course Type	ECTS	Grade (host)	Grade (home)
Module Grade				

S-I Special Topic of Interest Module: 5 ECTS				
Course Title	Course Type	ECTS	Grade (host)	Grade (home)
Seminars in Clinical Neuroscience	Seminar (SE)	5		
Module Grade				

W-D-C Elective Module: 0 ECTS				
Course Title	Course Type	ECTS	Grade (host)	Grade (home)
Module Grade				

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Date, Stamp & Signature of Local Coordinator  
at **Host** University

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Date, Stamp & Signature of Local Coordinator  
at **Home** University

## 2.1 Additional ECTS

In case a student wants to acquire more than 30 ECTS during the mobility semester, the modules and courses need to be indicated on this page.

Module: Elective ECTS: ____				
Course Title	Course Type	ECTS	Grade (host)	Grade (home)
Module Grade				

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Date, Stamp & Signature of Local Coordinator  
at **Host** University

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Date, Stamp & Signature of Local Coordinator  
at **Home** University

### 3 S-I-PJ Special Topic of Interest (Project) Module

#### Learning Outcomes\*

##### Subject specific

- Advanced knowledge and understanding of a phenomenon from the perspective of at least two disciplines

##### Methodological

- Ability to approach a phenomenon in an interdisciplinary manner

##### Generic/Instrumental

- Ability to write and follow a project plan

##### Systemic

- Interdisciplinary work/thinking
- Project-oriented work and organisational skill
- Critical evaluation of approaches & methods
- Quick orientation & navigation in mother and/or novel complex field
- Change of viewpoint/perspectives (intellectual mobility)
- Phenomenon-oriented thinking
- Problem-solving abilities

\*as defined in the MEi:CogSci curriculum

### 3.1 S-I-PJ Special Topic of Interest (Project) Module – Project Specifications

#### 3.1.1 General Project Information

Title of Specialisation Project	Supervisor	ECTS
Language processing in healthy and brain-damaged populations: neurolinguistic analysis of data from people living with Multiple Sclerosis	Christina Manouilidou, assoc. prof. (Faculty of Arts, Department of Comparative and General Linguistics, University of Ljubljana)	15
Course Title (if applicable)	Course Type	ECTS
<b>Teamwork/Co-Student (if applicable)</b>		

### 3.1.2 Summary of Topic/Phenomenon (3000-4000 characters)

#### Introduction

Multiple sclerosis (MS) is an autoimmune disease that leads to the deterioration of axons in the nervous system (Henry & Beatty, 2006). The most common symptoms in MS include physical or sensorimotor changes, but linguistic impairments and alterations are also present (Renauld et al., 2016). Thus, the analyses of language deficits became a focal point for neurolinguistic research. Neurodegenerative diseases in the brain, such as the language alternations in Multiple Sclerosis (MS) offer a more comprehensive picture on the general linguistic processes. Renauld et al. (2016) argues in their systematic review on language disorders in MS that this neurodegenerative disease is defined by various types of language symptoms: in some cases, the patients have a specific type of aphasia or show anomia; nevertheless, the most common symptom is word retrieval impairment in verbal fluency tasks. Thus, examining the effects that MS has on vocabulary, may elucidate how the human brain processes language, and it may lead to more targeted therapy methods.

#### Research Design and Methods

The present individual project investigates the way MS affects word-retrieval processes. For this, it analyses already collected data from native speakers of Greek, both in healthy (N = 11) and MS-diagnosed population (N = 18). The collected data is based on priming tasks (both overt and repetition priming), in which participants are shown words that belong either to the *abstract* or to the *concrete* category regarding their meaning. Through priming, it can be investigated how exposure to certain linguistic forms and two types of meaning (abstract and concrete) impacts language comprehension in MS. Further, given the two conditions in the priming task – the prime can be either overt or repeated – it can be examined how the priming mechanisms affect the processing of language. Overt means that the prime is *unmasked*: it is not followed by a visual *mask* that can lead to the impression of an absent prime, called *backward masking* (Breitmeyer, 1984). The repetition priming results are compared to overt priming answers. The analysed data and the comparison between the healthy and MS population is interpreted in the context of recent neurolinguistic studies with the aim of connecting the physical and neural processes of the brain with the more abstract workings of the mind.

#### Conclusion

In conclusion, the project aims to investigate how MS alters vocabulary and word-retrieval mechanisms in the brain, through which a more general understanding can be gained of the underlying linguistic processes in the context of MS, which may be useful in finding rehabilitation methods for people living with Multiple Sclerosis. The proposed project is relevant for cognitive science, as it takes an interdisciplinary approach to analyse linguistic alternations by intertwining neuroscientific and linguistic methods and theories, while potentially contributing to the design of possible medical applications regarding (differential) diagnosis and therapy.

#### References

- Breitmeyer, B. G. (1984). *Visual Masking: An Integrative Approach*. New York: Oxford University Press.
- Henry, J. D., & Beatty, W. W. (2006). Verbal fluency deficits in multiple sclerosis. *Neuropsychologia*, 44(7), 1166–1174. <https://doi.org/10.1016/j.neuropsychologia.2005.10.006>
- Renauld, S., Mohamed-Saïd, L., & Macoir, J. (2016). Language disorders in multiple sclerosis: A systematic review. *Multiple sclerosis and related disorders*, 10, 103–111. <https://doi.org/10.1016/j.msard.2016.09.005>

### 3.2 Project Plan

The parties are aware that the project has to be finished by **31<sup>st</sup> January 2024**.

Information on deadlines at host and home universities is available on the MEi:CogSci websites.

#### 3.2.1 Project Steps

Literature Research			Total Working Hours (WH)/ECTS: 100 / 4		
Working-package (WP)	Start – End	WH / ECTS	Activities	Resources required	Milestones (M)
WP Literature 1	10/2023 – 10/2023	WH / ECTS 1 ECTS / 25 WH	Gaining an overview of relevant theories, concepts, and paradigms	Laptop Access to literature, journals, libraries, data bases	M1 Lit
WP Literature 2	11/2023 – 11/2023	WH / ECTS 2 ECTS / 50 WH	Reviewing existing studies on the subject of the following: priming, language processing in Multiple Sclerosis (esp. vocabulary), spontaneous speech in Alzheimer's disease, neural oscillations	Laptop Access to literature, journals, libraries, data bases	M2 Lit
WP Literature 3	11/2023 – 11/2023	WH / ECTS 1 ECTS / 25 WH	Creating annotated bibliography	Laptop Access to literature, journals, libraries, data bases	M3 Lit

Formulating Hypotheses/Theses			Total WH/ECTS: 50 / 2		
Working-package (WP)	Start – End	WH / ECTS	Activities	Resources required	Milestones (M)
WP Theses1	10/2023 – 11/2023	WH / ECTS 1 ECTS / 25 WH	Formulating guiding questions/research questions and corresponding hypotheses or theses	Literature	M4 Theses
WP Theses2	10/2023 – 11/2023	WH / ECTS 1 ECTS / 25 WH	Hypotheses-testing based on the literature review and final construction of hypothesis	Consolidation time with the supervisors and discussion of proposed hypotheses	M5 Theses

Planning Means of Data Acquisition			Total WH/ECTS: 25 / 1		
Working-package (WP)	Start – End	WH / ECTS	Activities	Resources required	Milestones (M)
WP Plan1	11/2023 – 11/2023	WH / ECTS 1 ECTS / 25 WH	Given that the data is already collected: understanding the methods and methodology employed	Literature, access to previous studies/work, access to data bases, and lab space	M6 Plan

Data Acquisition/Collection				Total WH/ECTS: 25 / 1	
Working-package (WP)	Start – End	WH / ECTS	Activities	Resources required	Milestones (M)
WP Data1	12/2023 – 12/2023	WH / ECTS 1 ECTS / 25 WH	After looking through the collected data, finding ways to apply the hypotheses on the data	Access to the data, previous literature review	M7 Data Coll

Data Analysis/Interpretation				Total WH/ECTS: 125 / 5	
Working-package (WP)	Start – End	WH / ECTS	Activities	Resources required	Milestones (M)
WP Analysis1	12/2023 – 01/2024	WH / ECTS  5 ECTS / 125 WH	Content analysis and (possible) statistical analysis	Laptop for writing up and reporting on findings  Software for data analysis: (possibly) scripting in Matlab and R	M8 Analysis

Project Documentation				Total WH/ECTS: 50 / 2	
Working-package (WP)	Start – End	WH / ECTS	Activities	Resources required	Milestones (M)
WP Docu1	12/2023 – 01/2024	WH / ECTS 2 ECTS / 50 WH	Project documentation: Writing up the findings (see Data Analysis/Interpretation) and the project report: findings are written in the form of weekly reports (10-15 pages in total), the project report is ~1 page, 3000-5000 characters	Laptop and consolidation time with supervisor	M9 Docu start



### 3.2.2 Project Milestones

<b>Mile-stone</b>	<b>Result/"Product" and/or Deliverables</b>
M1 Lit	A general understanding of relevant theories and paradigms gained
M2 Lit	Literature notes and literature review finished.
M3 Lit	Annotated bibliography finished
M4 Theses	Formulating guiding questions and coming up with initial hypotheses (min. 3)
M5 Theses	Hypotheses-testing and final construction of hypothesis based on the literature review finished
M6 Plan	Familiarisation with the experimental set-up finished.
M7 Data Coll	Familiarisation with the collected data finished.
M8 Analysis	Statistical analysis and content analysis completed.
M9 Docu start	Project report written and proof-read.

### 3.3 Short Project Report (~1 page, 3000-5000 characters)

#### The systematic reviews

The first stage of the project consisted of gaining an overview of relevant theories, concepts, and paradigms in the form of systematic reviews on language processing on the following broader topics: Multiple Sclerosis and word-retrieval impairments; Alzheimer's disease and spontaneous speech, focusing mainly on literature related to *pause* and *fillers*; on laughter, coughs, and moans in the context of human non-linguistic vocal communication; and on aspects of prolongation (at the onset or last syllable) in both healthy population and population with Alzheimer's disease. This first stage included the creation of annotated bibliographies (especially on MS-related linguistic research findings) and the formulation of guiding questions that were discussed and evaluated in the context of bi-weekly meetings with Christina Manouilidou, assoc. prof., my supervisor. The systematic reviews contributed both to the topic and investigation of the present project, but also to another ongoing project on spontaneous speech in Alzheimer's disease. All the findings of the reviews have been discussed with the supervisor.

#### The priming study / data analysis

The analysed data and the comparison between the healthy and MCI, mild AD, and MS population was interpreted in the context of recent neurolinguistic studies. The findings suggest that there is a difference in word-retrieval processes based on the various clinical populations and on the type of word: concrete or abstract. However, no such differences have been found in the comparison between the MS and healthy control group. This outlines further questions for future investigation.

The collected data has been analysed in R studio, and besides descriptive statistics, independent t-tests and one-way ANOVA has been administered for between-group analyses, while paired t-tests were conducted for within-subject differences for the *concrete* and *abstract* word conditions in both priming and repetition context.

The findings were discussed and evaluated together with the supervisor. A presentation focusing on the difference between the MS population and healthy control group was prepared, and based on the presented results, further analyses have been conducted. The results of the groups of MCI and mild AD have been analysed and descriptive statistics conducted, but future evaluation of data is needed: cleaning of data is desired in the case of certain participants.

#### Final remarks

The final length of the weekly reports, including all systematic reviews, hypotheses, and possible analyses is of 22 pages. This is further complemented by tables and statistical analyses conducted in JASP and included in R Markdown documents. The present project provided the opportunity to learn about linguistics differences and alterations in various clinical populations and to improve programming and statistical skills while analysing quantitative data. Further, it made it possible to gain valuable insight into and experience in neurolinguistic research questions and methodology.

In conclusion, the project's aim to investigate how MCI, mild AD, and MS alters vocabulary and word-retrieval mechanisms has been achieved. The findings of the present project contribute to cognitive science via the analyses of language processing in clinical population and may outline possible future questions and approaches in clinical neurolinguistics.

As an additional outcome of the project, based on the preliminary findings, an abstract for the DUCOG 2024 conference has been written (15th Dubrovnik Conference on Cognitive Science – *Memory, space, language*, 23rd – 26th May 2024): it focuses on the differences between the MS population and the healthy control group in semantic processing of both abstract and concrete words in the context of overt and repetition priming.

#### Final grade for the project

\_\_\_\_ / \_\_\_\_

**Host Grade / Home Grade**

(see grade conversion matrix on last page)

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Date, Stamp & Signature of Supervisor (Host University)

## Grade Conversion Matrix

BRAT		BUD		LJUB		VIE		ZAG	
<b>A</b>	výborne (excellent)	<b>5</b>	jeles (excellent)	<b>10</b>	odlično (excellent)	<b>1</b>	sehr gut (excellent)	<b>5</b>	odličan (excellent)
<b>B</b>	vel'mi dobre (very good)	<b>4</b>	jó (good)	<b>9</b>	prav dobro (very good)	<b>2</b>	gut (good)	<b>4</b>	vrlo dobar (very good)
<b>C</b>	dobře (good)	<b>4</b>	jó (good)	<b>8</b>	prav dobro (very good)	<b>2</b>	gut (good)	<b>4</b>	vrlo dobar (very good)
<b>D</b>	uspokojivo (satisfactory)	<b>3</b>	Közepes (fair)	<b>7</b>	dobro (good)	<b>3</b>	befriedigend (satisfactory)	<b>3</b>	dobar (good)
<b>E</b>	dostatočne (sufficient)	<b>2</b>	Elégséges (satisfactory)	<b>6</b>	Zadostno (sufficient)	<b>4</b>	genügend (sufficient)	<b>2</b>	dovoljan (satisfactory)
<b>F</b>	nedostatočne (insufficient)	<b>1</b>	Elégtelen (fail)	<b>5</b>	nezadostno (insufficient)	<b>5</b>	nicht genügend (insufficient)	<b>1</b>	nedovoljan (insatisfactory)