# ERI LECTURA SUMMER SCHOOL

Pre-conference workshops EARLI SIG2 & SIG15 meetings

## 2-4 SEPTEMBER, 2024

VNIVERSITAT D⳩ VALÈNCIA

525 anys
1499 - 2024

**ERI-Lectura**
Estructura de Recerca
Interdisciplinar de Lectura

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SIG 2     SIG 15

meets

# WORKSHOPS

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| | Monday 2 Sept | Tuesday 3 Sept | Wednesday 4 Sept |
|---|---|---|---|
| 8.00-11.00 | Multilevel models for nested and crossed experimental designs.<br>Jimmie Leppink, Hospital virtual Valdecilla (Spain) | Introduction to Natural Language Processing for text comprehension research.<br>Héctor Pijeira, University of Jyväskylä (Finland) | Psychometric network analysis for insights from think aloud and eye tracking data.<br>Jennifer Cromley, University of Illinois at Urbana-Champaign (USA) |
| 11.00-11.30 | BREAK | | |
| 11.30-14.30 | Preregistration and Open Science. Lisa Spitzer, ZPID - Leibniz Institute for Psychology (Germany) | The Nuts and Bolts of Academic Journal Publication (with an emphasis on reading peer reviews and writing revisions). Ivar Bråten, University of Oslo (Norway) | Ai generated educational videos. Kevin Ackermans, Open University (The Netherlands) |

## REGISTRATION FEES:

**Each** workshop registration **fee is €25**. Participants have the freedom to select workshops independently based on their preferences. To register for workshops, participants must select and pay for their registration via the payment platform during the EARLI SIG2 conference registration process (they will be tagged as *Products*). This platform will open on 11 April.

## LOCATION:

Faculty of Psychology and Speech Therapy, University of Valencia (Avd. Blasco Ibáñez 21, Valencia)

## PUBLIC TRANSPORTATION NEARBY:

### Metro:

The closest stop is the one 170m from the faculty: **Facultats-Manuel Broseta.**

The metro lines that run are: 3 and 9.

### Bus:

The closest bus stop is the one right in front of the faculty: **158 - Facultat de Psicologia.**

The bus lines that stop at this stop are: 12, 30, 31, 71, 81.

## FUNDING:

# DAY 1. MONDAY, SEPTEMBER 2

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## 8.00-11.00h   Multilevel models for nested and crossed experimental designs

### Dr. Jimmie Leppink

Hospital virtual Valdecilla,
Santander, Cantabria,
(Spain)

**Background**. Randomized controlled experiments continue to be of vital importance to research in education, psychology, and related fields. During this workshop, we will take a look at two types of experimental designs that are increasingly common in these fields: nested designs (e.g., several schools participating in an experiment in which – for each class of pupils – participants are randomly allocated to a treatment or control group) and crossed designs (e.g., a crossover design in which half of the participants start with one or a few measurements in the control condition and then have one or two measurements in the treatment condition followed by one or a few measurements in the treatment condition, while the other half of the participants has the reverse order). These designs and appropriate multilevel models will be discussed and practiced during the workshop.

**Approach**. This workshop will use examples from the study of learning, assessment, and related phenomena of interest in psychology and education. The first half of the workshop will introduce key concepts of multilevel analysis and apply them to nested designs, whereas the second half of the workshop will focus on crossed designs. Example data files will be provided in CSV format during the workshop.

**Requirements**. It is recommended to have *Jamovi* installed prior to the workshop (https://www.jamovi.org/, preferably version 2.3.28 or later), and within Jamovi, install (or if already installed: update) the package 'GAMLj3' (will automatically use the latest version at the moment of installing or updating). We will be using this package (in combination with basic packages that are installed in Jamovi by default) for all analyses discussed and practiced during the workshop.

**More info:** https://www.youtube.com/@LeppinkAnalytics

# DAY 1. MONDAY, SEPTEMBER 2

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## 11.30-14.30h   Preregistration and Open Science

**Lisa Spitzer**

ZPID - Leibniz Institute for Psychology (Germany)

**Approach.** This workshop is aimed at researchers who are relatively new to preregistration or who have unanswered questions during preregistering their studies and would like to clarify these uncertainties. It will be divided into two parts:

The first part will give a general introduction to preregistration and will illustrate why it is important that researchers preregister their studies, which will be supported by the latest findings from our own research. In the second part, participants will be guided through the preregistration process and will start to create their own preregistrations using the PRP-QUANT template (https://doi.org/10.23668/psycharchives.4584). For this purpose, the template will first be presented in more detail. Participants will then have time to work on their own preregistrations.

The workshop will conclude with a demonstration of the ZPID's preregistration platform PreReg (https://prereg-psych.org/) where preregistrations can be published to complete the preregistration process.

Lastly, we will discuss all further questions and open issues so that at the end of the workshop, participants will be empowered to complete their preregistrations on their own based on the input of the workshop.

**Participant requirements.** No prior knowledge is necessary. Since the participants will work on their own preregistrations in the workshop, everyone is encouraged to think about a specific project idea or research question beforehand (e.g., a project they are currently working on) that they would like to implement in their preregistration. Participants need to bring a laptop.

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## 8.00-11.00h   Introduction to Natural Language Processing for text comprehension research

**Héctor Pijeira**

University of Jyväskylä
(Finland)

**Approach.** Natural language processing (NLP) refers to using computers to perform tasks involving human language. One of the NLP applications to the educational field is the automated scoring of students' short answers in reading comprehension tasks. This could on the one hand alleviate the workload of human raters and on the other hand make possible the provision of real-time feedback to students as well as the testing of experimental interventions. Advances in NLP enable high quality representations of words and sentences in a semantic space, which in turn allows for assessing students' text comprehension in their own words. Additional background information is available on the open access papers listed in the references, which participants could optionally read before the workshop, if they so wish. In this workshop, we will start with some required theoretical notes on basic concepts and notions of NLP and how they could be leveraged for text comprehension research. Then, we will move to guided hands-on activities where participants will, among other things:

· explore freely available pre-trained models and resources,
· compare word-based and sentence-based approaches,
· compute semantic similarity between student answers and model answers,
· explore different machine learning methods,
· compare machine learning and semantic similarity approaches, and
· evaluate the automated scoring using several indicators of reliability.

Participants are welcome to bring their own data (in any language) if they happen to have some data involving short student answers (up to a couple of sentences per answer), human scores for that data, and model answers for the corresponding question(s). Otherwise, a dataset will be provided for practice.

Although we will be playing with computer programming (i.e., Python programming language) for the workshop, no previous knowledge is required as the base code will be provided and we will be doing guided modifications together for the different techniques and tests.

We will wrap up the workshop with a critical discussion on affordances and limitations of NLP for text comprehension research, as well as possible use cases in and applications to attendees' own research.

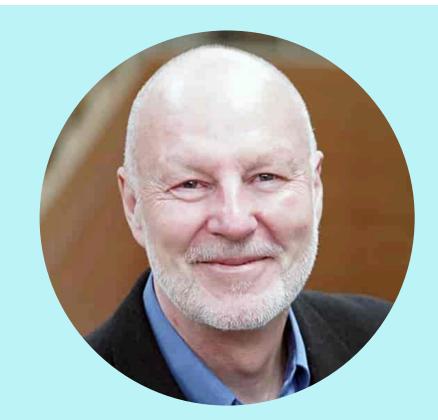**Participant requirements.** Participants are kindly requested to bring their own laptop.

### References

Pijeira-Díaz, H. J., Braumann, S., van de Pol, J., van Gog, T., & de Bruin, A. B. H. (in press). Towards adaptive support for self-regulated learning of causal relations: Evaluating four Dutch word vector models. *British Journal of Educational Technology.* https://doi.org/10.1111/BJET.13431

Pijeira-Díaz, H. J., Subramanya, S., van de Pol, J., & de Bruin, A. B. H. (in press). Evaluating Sentence-BERT-powered learning analytics for automated assessment of students' causal diagrams. *Journal of Computer Assisted Learning.* https://doi.org/10.1111/jcal.12992

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## 11:30-14:30h   The Nuts and Bolts of Academic Journal Publication (with an emphasis on reading peer reviews and writing revisions)

**Ivar Bråten**
University of Oslo
(Norway)

**Approach.** In this publication seminar, I will discuss the following questions (and everything else you may have wondered about but been afraid to ask regarding publishing in academic journals):

- What is a good (enough) contribution?
- What is a good fit between a piece of research and a journal?
- What goes on behind the scenes of the editorial process?
- When reviewers' suggestions are contradictory: Who counts? What do you do? How overcome rejection?
- When is additional work on a manuscript a waste of time?
- Isolated versus collaborative writing?

# DAY 3. WEDNESDAY, SEPTEMBER 4

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## 8.00-11.00h  Psychometric network analysis for insights from think aloud and eye tracking data

**Jennifer Cromley**

University of Illinois at Urbana-Champaign (USA)

**Approach.** Many education researchers are familiar with social network analysis of children in classrooms, teachers in school districts, and so on. The same network analysis techniques can be applied to individuals' knowledge structures (e.g., from think-aloud protocols or written responses), eye tracking scanpaths, navigation captured in logfiles, and other during-learning process data. I report on the added value of these network metrics with one think-aloud and one think-aloud-and-eye-tracking dataset, beyond the strategy use or count of gazes in AOIs that are typically used to predict learning outcomes. Considerations for analyzing different types of knowledge/attitudes (e.g., individuals verbalizing both positive and negative attitudes) we be discussed, as well as options for analyzing multiple data streams. Similarities and differences will be discussed in the context of small published literatures applying network analysis to either individual knowledge structures or scanpath/navigation data. Free resources for learning these techniques will be shared.

## 11.30-14.30h  AI generated educational videos

**Kevin Ackermans**

Open University (The Netherlands)

**Approach.** What if you could use AI to generate a video based on a podcast or article as instructional material? Or create multiple videos with small changes, such as a different colour shirt, more intense emotion, a larger presenter, or more head movement for your experiments? In this workshop, we will go through the workflows of creating AI-generated instructional videos using free and (when possible) open-source software. The workflows for this process are dependent on the amount of computing power you have access to. While AI-generating short lip-syncing on an animated still image can be easily rendered in the cloud, generating complex facial expressions and even emotions based on a podcast using AI is only possible with machine-learning frameworks such as TensorFlow. Your choice of machine learning models can also differ depending on cultural aspects: Some cultures require more expressive AI-generated emotion and facial expressions than others. After this workshop, you will be able to create an AI-generated video, and you will receive a manual you can fall back on when experimenting with more computing power.

**Participant requirements.** Bring your own laptop.