The 12th EARLI SIG 16 Metacognition and Self-regulated Learning conference

Fostering metacognition and self-regulated learning

¿How to realise potential at all stages of life and in different contexts?

Pre-conference workshop - 25 August 26 -

Workshop Title:

Recent Approaches in Analyzing Individual Differences in Metacognitive Accuracy

Workshop Facilitator(s) Include brief bios:

Dr. Emely Hoch – Emely Hoch is a postdoctoral researcher in the Department of Psychology at Zurich University. She earned her PhD in Psychology at the Leibniz-Institut für Wissensmedien in Tübingen, where she also worked as a research assistant. Her research focuses on metacognitive processes and the mechanisms underlying self-regulated learning, with a particular emphasis on technology-enhanced learning.

Suzanne Rotsaert – Suzanne Rotsaert is a doctoral researcher in the Department of Parenting and Special education at the University of Leuven (KU Leuven, Belgium) and has a Msc. in clinical psychology. Her research focuses on the development of metacognitive monitoring in the context of academic learning during primary school, with a specific focus on the domain-specificity vs. domain-generality of these metacognitive processes. She is funded by a joint KU Leuven - University of Melbourne PhD studentship.

Workshop description (background, objectives = 300 words, and bibliography):

There are multiple ways to analyzing item-level metacognitive monitoring judgments with respect to their alignment with task performance (i.e., monitoring accuracy). Though all of them having their merits, many of them have been heavily criticized in the literature (e.g., Fleming & Lau, 2014; Murayama et al., 2014). In this workshop, we will introduce two recent methodological approaches for analyzing trial-by-trial metacognitive monitoring judgments that overcome some of these critiques and offer improved assessments of metacognitive monitoring accuracy.

(1) Hierarchical Bayesian estimation of meta-d' (Fleming, 2017) This approach uses signal detection theory to estimate meta-d', a measure of metacognitive sensitivity, within a hierarchical Bayesian framework. It provides simultaneous individual- and group-level estimates, accounts for task performance and uncertainty in parameter estimation, and improves stability in cases of limited trial numbers.
(2) Modeling metacognitive accuracy with random effects from linear mixed effects models This approach allows the estimation of individual- and group level indicators while accounting for nested data structure or item-level covariates such as item difficulty or performance (e.g., Murayama et al., 2014).

The workshop will offer practical guidance on when (and when not) to use the proposed approaches (e.g., when applying the hierarchical Bayesian estimation of meta-d' to children samples), how data should be structured, and which key considerations are critical for their successful application and interpretation. In a hands-on section, we will apply both approaches to a provided dataset, gaining direct experience with the implementation and interpretation.

Target audience:

Everyone interested – some experience in analyzing or thinking about how to analyze accuracy of item-level monitoring judgments might be helpful.

Duration (half or full-day):

Half-day

Number of spots for participants:

25

Requirements for participants (e.g., prior knowledge, technical skills, material to bring, examples):

Bring a laptop with R (/MATLAB) installed on computer. Basic statistical skills and some experience in R (and MATLAB) might be helpful.

Workshop format (e.g., interactive activities, group discussions, oral presentation…):

Introduction followed by hands-on work with (own or) provided data.

References

Fleming, S. M. (2017). HMeta-d: Hierarchical Bayesian estimation of metacognitive efficiency from confidence ratings. Neuroscience of Consciousness, 2017(1). https://doi.org/10.1093/nc/nix007

Fleming, S. M., & Lau, H. C. (2014). How to measure metacognition. Frontiers in Human Neuroscience, 8. https://doi.org/10.3389/fnhum.2014.00443

Murayama, K., Sakaki, M., Yan, V. X., & Smith, G. M. (2014). Type I error inflation in the traditional by-participant analysis to metamemory accuracy: a generalized mixed-effects model perspective. Journal of Experimental Psychology: Learning, Memory, and Cognition, 40(5), 1287. https://doi.org/10.1037/a0036914