

DRAWING INFERENCE FROM DATA WHEN COMPARING GROUPS: AN EYE-TRACKING STUDY

Saskia Schreiter, and Markus Vogel
Heidelberg University of Education

When comparing groups and making an inference, several processes of information processing are involved, such as perception and attention as well as the interpretation of the data presented in the situation. These processes build the foundation for the construction of mental models of statistical situations (Eichler & Vogel, 2012). Preliminary findings from our still ongoing systematic literature review on data literacy in school education indicate that research to date has focused primarily on students' interpretation processes. These processes are typically analyzed based on students' given rationales after the statistical inference was drawn. It was found that students often struggle to consider variability in data and frequently fail to integrate local and global views of data (e.g., Ben-Zvi, 2004). While many studies focus on students' interpretative processes, little is known about the underlying perceptual and attentional processes as well students' internal processes of modeling statistical situations.

Using Eye-Tracking technology, this study aims to get insights into students' visual attention when comparing data distributions. A methodological triangulation with Eye-Tracking stimulated recall interviews provides further insight into internal processes related to mental modeling of statistical situations. In an Eye-Tracking stimulated recall interview, students are requested to describe their original thoughts as precisely as possible with the aid of gaze-overlaid videos that were recorded while they were working on the task. Data collection will take place in April 2022 and the sample will consist of primary and secondary school students. During data analysis students' performance levels of mental modeling will be differentiated based on an adapted version of Biggs and Collis' (1982) SOLO model. These levels differ by the number of features considered in the presented data (isolated or interrelated) and by the statistical nature of these features (center, spread, shape). A further research interest aims at an exploratory investigation of potential relationships between students' visual attention and their performance level of mental modeling.

References

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