**University of Leicester**

**BBSRC MIBTP Studentship Project 2024-5 entry.**

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| **Project Reference** |  |

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**Section 2 – *Project Information***

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| **Project Title** | Using measures of eye movements and EEG to understand effects of cognitive ageing on reading |
| **Project Summary** | |
| Healthy ageing is associated with reductions in visual and cognitive abilities that are required for many activities of daily life (e.g., reading, navigation, object-finding). These losses in visual and cognitive abilities have been widely studied using behavioural tasks, to draw inferences about differences in how people process information across the lifespan. Little is known, however, about the neural correlates of these changes, although such information is essential for understanding how normal ageing impacts on brain processes. This project addresses this issue with a specific focus on ageing effects on reading, using a combination of measures of eye movements and EEG to understand the behavioural and neural correlates of ageing effects on reading. The combined recording of these methods provides novel, state-of-the art insights into cognitive changes that occur naturally with older age.  The research project will be undertaken in the School of Psychology and Vision Sciences laboratories at the University of Leicester, using a state-of-the-art EEG system and eye-trackers, including novel methods for co-registering EEG and eye movements in real-time. Our research group is the first to apply such methods to understanding ageing effects in reading.  This project will involve recruiting older adults (aged 65+ years) and younger adults (aged 18-30 years). The older adult participants for this research would be recruited using a database of older adult volunteers while young adult participants would be recruited from the University student population.  The PhD student will be fully trained in the design of human experimental studies and the use of eye-tracking and EEG, including the novel co-registration of these methods. Full training will also be given in statistical analysis methods using linear mixed-effect modelling and statistical packages in the R programming environment. The supervisory team has a strong track record of international collaboration and strong track record of publications. The student will be supported in presenting their research at national and international conferences, collaborating with other labs worldwide, and publishing their research in leading cognitive neuroscience journals.  Techniques that will be undertaken during the project  High-precision eye movement recording  Electro-encephalography  Co-registration of eye movements and EEG  Linear mixed-effect modelling in the R programming environment | |
| **References** | |
| Degno, F., Loberg, O., Zang, C., Zhang, M., Donnelly, N., & Liversedge, S. P. (2019). Parafoveal previews and lexical frequency in natural reading: evidence from eye movements and fixation-related potentials. Journal of Experimental Psychology: General, 148, 453-474.  Henderson, J. M., Luke, S. G., Schmidt, J., & Richards, J. E. (2013). Co-registration of eye movements and event-related potentials in connected-text paragraph reading. Frontiers in Systems Neuroscience, 7, 28. | |

**To apply please refer to**

[**https://le.ac.uk/study/research-degrees/funded-opportunities/bbsrc-mibtp**](https://le.ac.uk/study/research-degrees/funded-opportunities/bbsrc-mibtp)