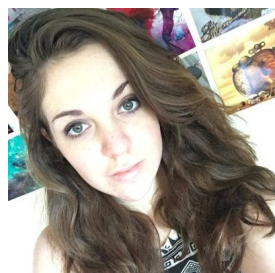


Thursday 30th November 4pm – Maynooth University Psychology Department

Caoilainn Doyle (Maynooth Psychology Department)

Executive Function in Dyslexia: Examining Profile Associated with Dyslexia and Comorbid Dyslexia-ADHD and Exploring the Near and Far Transfer Effects of Executive Function Training in Dyslexia Alone



Caoilainn is a research assistant here at the Department of Psychology, Maynooth. Prior to moving to Maynooth, Caoilainn was a graduate research student at Dublin City University (DCU) and worked on a project looking at how we can improve the brain's ability to stop irrelevant thoughts or responses, which can have an impact on autism or Attention Deficit Disorder.

Abstract:

Although there are several competing theories to explain dyslexia, no clear causal pathway has been established. Current theories also fail to address associated socio-emotional difficulties and high co-occurrence of dyslexia with ADHD. Executive function (EF), an umbrella term for a triad of high-level cognitive processes associated with pre-frontal brain regions – response inhibition (RI), working memory updating and switching, is a candidate factor for explaining the overlap between dyslexia and ADHD and co-occurring socio-emotional issues. EF appears to be a modifiable trans-diagnostic factor differentially implicated in neurodevelopmental conditions and therefore may offer novel routes for targeted interventions. Yet, it is unclear if EF is an overlapping impairment associated with dyslexia and comorbid dyslexia-ADHD, and which aspects of EF are important for explaining severity of reading and socio-emotional outcomes. Addressing methodological issues from previous EF profiling studies, this PhD aimed to (a) examine EF in both dyslexia conditions using Miyake's 3-factor model (response inhibition-common EF, updating and switching – specific EFs) (study 1), (b) explore the ability of EF to predict dyslexia diagnosis and severity of symptoms expressed in core reading and non-core socio-emotional domains (study 1), and (c) explore the near (EF, N2 and P3 ERPs) and far (reading, self-regulation, socio-emotional problems) transfer effects of targeted common EF (inhibition) training in dyslexia (study 2). Study 1 established that response inhibition (RI) and updating are overlapping transdiagnostic impairments associated with dyslexia and comorbid dyslexia-ADHD. Logistic and linear regression analyses suggest that RI and updating impairments are predictive of dyslexia diagnosis and core reading outcomes (study 1). The predictive role of RI in dyslexia diagnosis and severity of reading outcomes was further confirmed in a secondary sample (study 2). A 6-week targeted training intervention aimed at ameliorating these RI impairments led to significant improvements in RI at both cognitive and neural levels in dyslexia alone (study 2). As predicted, RI training effects also transferred to changes in other EF abilities (updating and switching), reading ability, socio-emotional problems and capacity for self-regulation (study 2). Overall findings suggest, for the first time, that RI is an overlapping impairment in dyslexia and comorbid dyslexia-ADHD that is implicated in reading. RI also appears to be modifiable at the neural and cognitive levels which transfer to improvements in associated issues.