

Project Details	
Project Code	MRC22NMHBa Petrini
Title	Being in a child shoes: Assessing changes in parents' empathy and perspective-taking by using a combination of virtual reality and EEG methods
Research Theme	Neuroscience & Mental Health
Summary	Perspective-taking (cognitive awareness of another's state) and empathy (emotional/affective response) are important for sensitive and constructive parenting. However, these constructs are difficult to induce and measure and their underlying brain mechanisms during parenting remain unclear. This project will use a combination of virtual reality, electroencephalogram (EEG) and self-report measures to examine changes in parents' empathy to inform future interventions.
Description	<p>Empathy has been given many diverse definitions, all of which describe a process allowing an individual to experience the feelings of another person and understand the situation that another person is in (Neumann et al., 2015). Empathy deficits have long been associated with a range of disorders and offending behaviours, including risk of offending (Jolliffe &amp; Farrington, 2004), psychopathy (Blair, 2012), sexual offending (Mitchie &amp; Lindsay, 2012), and autistic spectrum disorders (Baron-Cohen, 2012). The relationship between empathy and parenting difficulties, however, is less widely researched, despite empathy playing a significant role in both recognising and understanding a child's emotions. Furthermore, empathy is notoriously difficult to induce and measure with self-report questionnaires being prominently used until a few decades ago (Neumann et al., 2015). The development of new technologies such as immersive virtual reality (IVR) has facilitated more naturalistic and effective ways to induce empathy in lab settings, while the development of social-cognitive neuroscience has allowed more objective methods such as electroencephalogram (EEG) to measure changes in underlying brain activity in response to changes in empathy (Neumann et al., 2015). For example, a very recent study successfully used IVR and EEG to measure changes in brain activity in participants watching a video developed by a charity organisation depicting child maltreatment (Alimardani et al., 2020). This study showed that changes in self-reported measures of empathy when watching the video correlated with changes in EEG signals, especially in theta and alpha frequency bands in the frontal area. Furthermore, IVR has been successfully used to increase empathy in mothers when taking the perspective of (embodying) a child-avatar who interacted with a supportive or derogative parent (Hamilton-Giachritsis et al., 2018). Hence, a combination of IVR and EEG could be used to induce and measure empathy effectively, and assess changes in parents' brain and behavioural responses with implications for future interventions as well as theories of empathy. The aim of this PhD project is to combine EEG and IVR technologies using tasks similar to that used by Hamilton-Giachritsis et al. (2018) to determine brain responses during changes in negative and positive affective states of empathy. With parents embodying a young child-avatar, we will examine associations between self-report and EEG measures before and after IVR exposure as in Alimardani et al. (2020) as well as changes in parenting preferences following IVR. The student will first do a systematic evaluation of the</p>

	<p>literature to identify the current parental empathy measures to be used alongside EEG recordings and will undertake training with Dr Petrini in Bath and Dr Finnegan in Cardiff to attain a firm ground in using EEG and IVR respectively. The student will then finalise the IVR environments to be used in testing including variations in interaction between the child-avatar embodied by participants and the virtual parent in the scene, with input from Dr Petrini, Prof. Hamilton-Giachritsis and Prof. Watson. Finally, the student will be encouraged to disseminate the findings beyond academia into practice-based organisations thanks to Prof. Hamilton-Giachritsis existing contacts (e.g., NSPCC), this may include presenting at annual training conferences and writing practice-focused reports, with the key element being to provide the 'So What?' aspect; i.e., what do the academic findings mean for practice. By the end of the PhD, the student will be also able to undertake a relevant placement of up to three months at Cornerstone Partnership (<a href="https://www.thecornerstonepartnership.com/">https://www.thecornerstonepartnership.com/</a>) thanks to Prof. Watson existing contacts. Cornerstone Partnership have produced VR films and experiences for use in social work training and with new adopters/foster carers and to help children in the care system.</p>
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