Project Details	
Project Code	MRC19NMHCa Thapar
Project Title	Investigating the childhood neurodevelopmental origins of adult mental illness
Research Theme	Neuroscience & Mental Health
Summary of Project	Autism and ADHD are associated with elevated risk of later mental illnesses e.g. depression and psychosis. We do not know why this happens. One explanation is shared genetic risks. However, alternative explanations require testing.his PhD will use genetic and epidemiological methods to test a series of different hypotheses as to why.
Project Description	Autism and ADHD (child neurodevelopmental disorders NDDs) are associated with an elevated risk of later mental illnesses e.g. depression and psychosis. We do not know why this happens. It is crucial to identify risk mechanisms that explain why some children with NDD develop adult mental illness to help refine existing classification systems, stratify high-risk children for enhanced clinical monitoring and inform prevention and early intervention strategies. This PhD utilises new data generated by a Wellcome Trust Collaborative Award between Cardiff and Bristol Universities to test hypotheses on why child NDDs show links with later adult mental illness. One explanation is shared genetic risk factors (pleiotropy). There is extensive genetic overlap between different brain disorders but treatments are not the same (e.g. stimulants for ADHD, antidepressants for depression). This highlights they are not biologically identical and that it is important to test alternative hypotheses to pleiotropy because they have different clinical implications. The first hypothesis (causal hypothesis) is that childhood NDDs directly cause adult mental illnesses in the way that hypertension can cause stroke. For example, the experience of having an NDD throughout childhood is a chronic stressor and that could cause later mental illnesses such as psychosis or depression. A second hypothesis (subgroup hypothesis) is that certain individuals (a subgroup) present with features that look like childhood NDD (e.g. autism) but that actually represent the early stages or antecedents of a later adult mental disorder (e.g. schizophrenia) (Riglin et al 2016). It is important to test these different hypotheses because the diagnostic, prevention and treatment implications will differ depending on why child NDD and adult mental illnesses are associated. For example, if a sub-group of children who look as if they have ADHD are actually showing the antecedents of psychosis-they need to be identified early and the treatment plan might need to be changed. The final aim of this project is to examine whether child NDDs (a very broad group) can be stratified more meaningfully than current diagnostic systems in terms of links with future mental health outcomes. The aim is to use genomic and observed data (e.g. family history) to test the hypothesis that genomic stratification will enable a better method than diagnosis. The student will assess how well a stratified high-risk NDD subgroup predicts future adult mental illness in ALSPAC and other large genotyped data sets.

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