

Genetic and Environmental Epidemiology of Attention
Deficit Hyperactivity Disorder in Young Australian Adults

Jane Ebejer

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I certify that the substance of this dissertation has not already been submitted for any degree and is not currently being submitted for any other degree or qualification. I certify that any help received in preparing this dissertation and all sources used have been acknowledged in this dissertation.



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Abstract

The inattentive and hyperactive-impulsive behaviours that comprise attention-deficit hyperactivity disorder (ADHD) have been documented by physicians over the last two centuries. It is well established that ADHD is associated with mild to severe disadvantage across multiple domains such as peer and family relations, academic achievement, emotional and physical health, driving behaviours and employment opportunities, alcohol abuse and dependence, increased divorce and lost work productivity. There are often comorbid conduct problems that compromise development and increase symptom related disadvantage, around 50% of children affected by ADHD continue to be disadvantaged by this syndrome as adults. However less work has been done to characterise ADHD in adults' and few studies have examined the occurrence of this syndrome in Australian adults. A series of four studies were conducted; the first study shows the persistence of symptoms into adulthood was 55.3%, resulting in a prevalence of 1.1% for a young adult sample. This study also indicated women with ADHD reported greater exposure to environmental adversity during childhood than men with ADHD ($p < .001$ and $p > .05$ respectively). Within the second study, latent class analyses provided an alternative perspective to the disadvantage associated with different groups of symptoms and showed women with inattention, combined symptoms and conduct problems experienced greater difficulties than men with the same symptoms. Additionally there was a higher monozygotic than dizygotic twin concordance for symptoms of hyperactivity-impulsivity ($z = 4.42$) and conduct problems ($z = 2.19$) suggesting a genetic component to class membership. The third study used classical twin methodology to show unique environmental factors accounting for variation in ADHD differed by sex ($p < .05$), supporting the results of the preceding studies. This study also explored differences in heritability estimates and self, versus mother's report of ADHD symptoms indicating that the drop in heritability that occurs in adulthood is due to greater error variance in self-reported symptoms and a genetic component influencing maternal report of symptoms. The fourth study utilised a unique dimensional measure of ADHD for genome-wide association, there were no significant genetic associations between inattentive, hyperactive-impulsive or combined type behaviours. The strongest association was between symptoms of hyperactivity-impulsivity and rs2110267 (4.62×10^{-7}).