

Name: Marie-Elyse Lafaille-Magnan

Organization: McGill University

Abstract title: Are environmental risks more robust than genetic risk for ADHD symptomatology?

Background: Attention Deficit Hyperactivity Disorder (ADHD) has a prevalence of 9.4% in children 2-17 years of age (6.1 million; National Survey of Children's Health 2016), with a 4:1 ratio in boys (Willcutt, 2012). Long term outcomes of ADHD include school drop-out, anti-social behaviour, teenage pregnancy, it is important to understand the developmental processes in its earliest origins (St-Pierre, 2016).

Objective: To evaluate how genetic susceptibility and the early social-parental environment modify the risk for ADHD from prenatal adversity, with an attention to sex and gender specific effects

Study Design/Methods: The DREAM-BIG project (Developmental Research in Environmental Adversity, Mental health, Biological susceptibility and Gender) is a consortium of similarly designed prenatal cohorts with cognitive, behavioral, biological, genetic and imaging measures harmonized so as to be able to probe simultaneously multiple datasets using complex of gene by environment interaction during the perinatal period. Sample: The MAVAN (Maternal Adversity Vulnerability and Neurodevelopment) project, a Canadian population study of children and their mothers. On average mothers were 30 years old and 80% were college or university educated. Measures: Center for Epidemiologic Studies Depression Scale (CESD) – prenatal; Child Behavior Checklist (CBCL), attention and hyperactivity subscale – ages 4 and 5 ($\bar{x}=2.21$, $s.d.=1.74$, $n=364$; $\bar{x}=1.78$, $s.d.=1.68$, $n=309$) Analysis: We investigate the simultaneous analysis of sex-specific interactions between genetic risk and environment latent factors, viz. maternal depression, education, parent-child interaction, sex of child. We capture genetic risk with a polygenic risk score (PRS) for ADHD. We use Latent Environment & Genetic InTeraction (LEGIT) model, an R package developed in the lab (Jolicoeur-Martieau, 2018).

Results: We found that women with higher prenatal depression (CESD) had more severe ADHD. However, there were no genetic or gene by environment interactions. We found that higher percentage of mothers looking over at their child increased the risk of higher symptoms of ADHD on the CBCL. Meanwhile, MBQSR and Ainsworth sensitivity at 18 months decreased the observations of ADHD symptoms on the CBCL. Younger and less educated mothers had children with increased ADHD symptomatology.

Conclusions: Our results will be tested in other studies of DREAMBIG. They suggest a potential role for environmental factors across the early childhood in the expression of ADHD, with implications ranging from pregnancy to early perinatal care.