

# **& GENDER** **SEX** **MENTAL** **S** **HEALTH**

**First scientific day of the Chair on Sex, Gender and Mental Health  
from the CIHR Institute of Gender and Health**

**March, 27<sup>th</sup>, 2009**

# Scientific Program

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- 8:30 - 9:00**      **Sonia Lupien**, PhD, Scientific Director of the Fernand-Seguin Research Centre of Louis-H. Lafontaine Hospital, Université de Montréal - Chairholder of the Chair on Gender, Sex and Mental Health
- 9:00 - 10:00**      **Joy Johnson**, PhD, FCAHS, RN, (Keynote), University of British Columbia, Vancouver - Scientific Director of Institute of Gender and Health (CIHR)
- 10:00 - 10:15**      Coffee break
- 10:15 - 11:00**      **Sylvana Côté**, PhD, Université de Montréal  
*The development of sex differences in antisocial behaviours: Possible aetiologies and intergenerational transmission.*
- 11:00 - 11:45**      **Jens Pruessner**, PhD, Douglas Mental Health University Institute Research Centre, McGill University, Montreal  
*Sex, gender, hormones and the brain*
- 11:45 - 13:30**      Poster session and Lunch
- 13:30 - 14:30**      **Meir Steiner**, MD, PhD, FRCPC, (Keynote), McMaster University, Hamilton, Ontario  
*The Burden of Female-Specific Mood Disorders*
- 14:30 - 15:15**      **Adrianna Mendrek**, PhD, Fernand-Seguin Research Centre of Louis-H. Lafontaine Hospital, Université de Montréal  
*Schizophrenia: Trapped in the brain of the wrong sex?*
- 15:15 - 16:00**      **Aline Drapeau**, PhD, Fernand-Seguin Research Centre of Louis-H. Lafontaine Hospital, Université de Montréal  
*The influence of social anchors on the gender difference in the use of mental health services*

*The presentations will be in English given that we have the honour of receiving the visit of Dr. Joy Johnson, Scientific director of the Institute of Gender and Health, CIHR*

## Cocktail - 16 :30

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## Conférence grand public - 18 :30

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**Rose-Marie Charest** Psychologue et Présidente de l'Ordre des Psychologues du Québec  
« Santé mentale : évolution des rapports hommes – femmes »



# Abstracts of Student's Poster

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“Revisit your data in order to assess the presence of sex/gender differences!”

#	Surname	Name	Poster Title
1	Dedovic	Katarina	<i>Hippocampal volume and depression risk factors in healthy men and women</i>
2	Doramajian	Caroline	<i>Friendship and group acceptance protect victimized boys and girls differently</i>
3	Duchesne	Annie	<i>Sex and Stress: neural activation changes during psychosocial stress.</i>
4	Herzig	Alyssa	<i>Perceived Control and Coping Predict Depression in Retirees :A Gender Comparison</i>
5	Jiménez	José Alfredo	<i>Sex differences in functional neuroanatomy during mental rotation and testosterone influence in schizophrenia and health men.</i>
6	Juster	Robert-Paul	<i>Sex and gender-roles divergently predict physical symptoms and allostatic load</i>
7	Lakis	Nadia	<i>Investigation of sex differences in emotional episodic memory in schizophrenia patients: an fMRI study</i>
8	Laplante	François	<i>Amygdala dopamine depletion produces opposite effects on anxiety-related behaviour in male and female rats.</i>
9	Lord	Catherine	<i>Stress in Women with Postpartum Obsessive-Compulsive Disorder: a neuroimaging study.</i>
10	Lord	Catherine	<i>Perinatal Obsessive-Compulsive Scale (POCS)</i>
11	Mancini	Adham	<i>Sex differences in corpus callosum fractional anisotropy in schizophrenia patients: A pilot tractography study using Diffusion Tensor Imaging</i>
12	Marin	Marie-France	<i>Emotional Newspaper Headlines: Guys, you report not being concerned by them but that is not what your body reports!</i>
13	Martin	Andrea	<i>Interaction effects between the quality of the parent-child relationship and correlates of internalizing disorders in adolescents in Quebec</i>
14	Plante	Nicolas	<i>Programs to improve responses to men help seeking behaviour could be enhanced with a theory driven approach.</i>
15	Sindi	Shireen	<i>Sex differences in cortisol secretion:Stressful versus non-stressful testing environments</i>
16	Trepanier	Lyane	<i>Sex and Gender Differences in Depressive Symptomatology and Stress Hormone Levels: An Intriguing Time of Day Effect</i>
17	Trépanier	Geneviève	<i>School failure at the beginning of the elementary school : should we have to be concerned for girls like boys</i>

Poster # 1 **Hippocampal volume and depression risk factors in healthy men and women**

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Katarina Dedovic<sup>1</sup>, Annie Duchesne<sup>1</sup>, Sonja Damika Lue<sup>1</sup>, Julie Andrews<sup>1</sup>, Simona Efanov<sup>1</sup>, Veronika Engert<sup>1</sup>, Thomas Beaudry<sup>1</sup>, Ashley Ortega<sup>2</sup>, Jens C. Pruessner<sup>1</sup>

<sup>1</sup>Douglas Mental Health University Institute, McGill University, Montreal, QC, Canada, <sup>2</sup>McGill University, Montreal, QC, Canada

**Background:** Major Depressive Disorder (MDD) is a severe mood disorder, affecting twice as many women than men. MDD has been repeatedly linked to hippocampal (HC) volume abnormalities. However, it is still debated whether these abnormalities present a vulnerability factor, or are a consequence of the illness. In this study, we investigated whether variations in HC volume are associated with subclinical depressive symptoms in a normal population of university students.

**Methods:** Sixty-three (32 women) healthy university students (19-32) were recruited. Subclinical levels of depression were assessed with the Beck Depression Inventory (BDI), the Hamilton Depression Rating Scale and the Montgomery-Åsberg Depression Rating Scale. Complete psychometric assessment was also obtained. Participants were scanned using a 1.5T scanner. HC volumes were assessed using a validated manual segmentation protocol.

**Results:** Preliminary analysis of first thirty subjects revealed negative correlations between depression scores and HC volume in men only ( $p < 0.05$ ). Furthermore, lower HC volume was associated with higher stress levels ( $p < 0.025$ ). In women, HC volume was also negatively correlated with stress levels, while positive correlations were found between HC volume and NEO extraversion levels and active coping strategies (all  $p < 0.05$ ).

**Conclusions:** Negative correlations between HC volume and depression scores in healthy men suggest that HC volume might be a vulnerability factor. While in women, absence of a relationship between HC volume and depression levels could indicate that HC abnormalities usually found in depressed women may reflect the effect of the illness.

Poster # 2 **Friendship and group acceptance protect victimized boys and girls differently**

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Caroline Doramajian, Jonathan B. Santo, William M. Bukowski

Concordia University, Center for Research in Human Development

The present study examined whether mutual friendship and group acceptance moderate the relationship between victimization and depression differently for early adolescent boys versus girls. Same-sex peer nominations of depressive symptoms, victimization, and friendship were obtained for 430 early adolescents attending fifth or sixth grade (222 boys and 208 girls; mean age of 10 years 11 months). Group acceptance was defined as the number of unlimited friendship nominations received, while mutual friendship, a more intimate peer experience, was based on reciprocated first or second best friend choices. Analyses performed with structural equation modeling revealed that boys and girls differed in the associations among mutual friendship, group acceptance, victimization, and depression. In line with the theoretical postulation that males and females ascribe distinctive meaning to intimacy in their peer relationships, mutual friendship served as a buffer against depression for victimized girls but not boys, and group acceptance served as a buffer against depression for victimized boys but not girls. Discerning such gender-specific interpersonal factors that protect at-risk early adolescents from depression is especially important during a developmental period when gender differences in the prevalence of depression become increasingly apparent.

Poster # 3 **Sex and Stress: neural activation changes during psychosocial stress.**

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Annie Duchesne, Najmeh Kahili Mahani, Claudia Buss, Katarina Dedovic and Jens C. Pruessner

Douglas Mental Health Institute, McGill University, Montréal, Quebec, Canada

**Introduction:** Within Health research, one of the best-replicated and most consistent findings is the difference in vulnerability between men and women to fall ill from stress-related diseases. Sex differences in stress reactivity are consistently shown in human and animal studies, although little is known about the neural mechanism mediating these effects.

**Objective:** The main goal of this project was to assess gender differences of endocrine and neural activation changes during a psychosocial stress paradigm.

**Methods:** We exposed 26 women and 25 men to a functional magnetic resonance imaging stress task (Montreal Imaging Stress Task; MIST) consisting of challenging mental arithmetic with a predetermined failure rate and negative feedback. Cortisol levels were also measured from saliva samples during imaging.

**Results:** As a whole, men showed a significant cortisol increase in response to the paradigm, while women did not (significant sex by time ANOVA  $F=3.19$ ;  $p=0.008$ ). Following a K-Means cluster analysis looking specifically at responders and non responders, we demonstrated that during stress neural activity of men responders includes deactivation of the orbitofrontal cortex and hippocampus ( $t = 3.44$ ;  $p < 0.001$ ) while women responders did not showed hippocampal deactivation. In the non responders only women present a deactivation of the cuneus, precuneus and sensory cortex ( $t = 3.44$ ;  $p < 0.001$ ).

**Conclusion:** Our endocrines and neural activation results support important sexual differences in regard to stress reactivity to a challenging mental arithmetic. Recently, several studies have demonstrated that achievement-type tasks are not the best stressors for women which might explain the observed sex difference. The current results represent a first attempt to characterize the neurobiological basis that underlies the gender differences in susceptibility to stress-related disease.

Poster # 4 **Perceived Control and Coping Predict Depression in Retirees: A Gender Comparison**

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Alyssa Herzig, June Chaikelson, Dolores Pushkar

Concordia University

Longitudinal research combining genders has indicated that subgroups of retirees have different trajectory paths for SWB. This research suggests that there is a strong need for studies examining how and why retirees differ in adjustment to retirement. Considering that men and women tend to have unique work histories, responsibilities, social roles, and have been shown to adjust differently to retirement, the present study is aimed at developing gender-specific models for how coping predicts well-being in retirement. The gender-specific models are developed via hierarchical regressions, and well-being is defined by scores on the Center for Epidemiological Studies Depression Scale C-ESD. Predictors examined include the frequency of use of four higher order coping strategies, components of Perceived Control, and associated interactions. The effects of stress level and demographic variables are controlled. Analyses are conducted with 188 women and 167 men who entered the longitudinal study within three years of retiring from over 20 years in the work force. Results suggest both generalized and gender-specific determinants of psychological health in retirement. As well, the gender-specific impacts of components of Perceived Control in moderating associations between strategy use and psychological health are examined and discussed.

Poster # 5 **Sex differences in functional neuroanatomy during mental rotation and testosterone influence in schizophrenia and health men.**

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José Jiménez , Adham Mancini-Marie , Melissa Rinaldi , Martine Germain, Marc Lavoie, Adrianna Mendrek .

Department of Psychiatry, Fernand-Seguin Research Centre of Louis-H. Lafontaine Hospital,,  
University of Montreal, Montreal, Quebec, Canada

**Introduction:** Investigations of visuospatial abilities and other cognitive functions in schizophrenia have produced inconsistent results. Testosterone has been implicated in cognitive functions with overall higher levels predicting better visuo-spatial abilities. Based on our recent fMRI study suggesting reversal of normal sexual dimorphism in brain function of schizophrenia patients during processing of emotional stimuli (Mendrek et al, 2007) we hypothesized existence of similar phenomena in performance of mental rotation as well as disturbed correlations between testosterone and cerebral activation during mental rotation task.

**Methods:** 16 men schizophrenia (SZ-M) and 7 schizophrenia women (SZ-W) were compared to 14 healthy men (HM) and 7 healthy women (HW) during performance of mental rotation task, as well as correlational analysis of fMRI data with the level of testosterone in schizophrenia men. BOLD echoplanar images were acquired on a 3 Tesla Siemens TRIO system. Analyses were performed using SPM5 (UK Wellcome Institute) using parietal and lateral frontal mask. Only corrected p-values, voxels  $\geq 5$  and z-scores  $\geq 3.00$  were considered.

**Results:** In terms of cerebral function, random effects analyses revealed significant bilateral activation in the superior parietal (BA 7) and right inferior parietal (BA 40) cortex in HM and diminished, though detectable activations in the right precuneus (BA 7) and right superior parietal cortex (BA 7) in SZ-W. HW and SZ-M showed no detectable activations. Activations in the frontal cortex were significant only in the group of HM in the bilateral superior frontal and right middle frontal cortex. Schizophrenia patients exhibited significantly diminished level of plasma testosterone as well as performance on a mental rotation task and while significant correlations between testosterone levels were evident in healthy controls in the right precuneus, supplementary motor area and left hippocampus, the only significantly region in patients was a circumscribed area of the left inferior parietal cortex.

**Conclusions:** Consistently with some previous reports we found mainly parietal activations in HM. Interestingly, in schizophrenia the patterns of sex differences was somewhat reversed with SZ-W displaying male-like, though diminished, activation pattern similar to HM, and SZ-M resembling HW with no significant activation in the parietal regions. In relation to testosterone we found not only diminished levels of testosterone in patients, but also disturbed pattern of testosterone-correlated activation during mental rotation task.

Robert-Paul Juster<sup>1,2,3</sup>, Andrea Perna<sup>2</sup>, Alireza Hashemi<sup>2</sup>, Shireen Sindi<sup>1,2,3</sup>, Marie-France Marin<sup>1,2,4</sup> & Sonia Lupien<sup>1,2</sup>

Fernand-Seguin Research Centre of Louis-H. Lafontaine Hospital,, Université de Montréal<sup>1</sup>; Centre for Studies on Human Stress, Laboratory of Psychoneuroendocrinology<sup>2</sup>; Neurology and Neurosurgery Department, McGill University<sup>3</sup>; Neuroscience Department, University of Montreal<sup>4</sup>

**Introduction:** Sex differences in stress-related conditions are undoubtedly moderated or even mediated by socio-cultural pressures that shape individual's personality traits. One such variable is gender-role identity, which represents one's level of masculinity and femininity based on the endorsement of gender-typed attributes. Do gender-roles differ from sex in their ability to predict sexually dimorphic disease symptomatology and trajectories? We assessed this research question by investigating physical symptoms and physiological dysregulations based on the allostatic load (AL) model. Chronic stress is theorized to induce AL, which represents the "wear and tear" that occurs when normal homeostatic functioning is dynamically shifted towards abnormal ranges via the prolonged secretion of the stress hormone cortisol and the subsequent "domino effect" this strain exerts on interdependent biological systems. We hypothesized that gender-roles would predict self-reported physical symptoms and AL indices of physiological dysregulations independently of sex in a sample of distressed workers.

**Methods:** Nineteen female and eleven male full-time Montreal general workers ages 27 to 65 participated in a larger pilot study of chronic workplace stress. The 42-item Wahler Physical Symptoms Inventory was used to measure physical symptoms. Blood samples were collected and assayed for cortisol, dehydroepiandrosterone-sulphate, c-reactive protein, fibrinogen, insulin, glycosylated haemoglobin, albumin, creatinine, pancreatic amylase, triglycerides total cholesterol and HDL-cholesterol. Participant's waist-to-hip ratio, heart rate, systolic and diastolic blood pressures were also recorded. All biomarker levels falling within high-risk quartiles (high and low ranges) based on biomedical normative ranges were aggregated into an AL index. The 30-item short-form Bem Sex Role Inventory was administered to assess scores for masculinity and femininity, which were then transformed into Studentized t-ratios for statistical purposes.

**Results:** Two linear regressions were computed with sex, gender roles, and age entered as coefficients for both (1) physical symptoms and (2) AL indices. Model 1 was statistically significantly predicted by sex and gender role, whereby being male and/or having greater masculinity related to increased ratings of physical symptoms. Model 2, however, was significantly predicted by gender role only, with higher masculinity ratings relating to higher AL levels.

**Discussion:** Our findings support the inclusion of gender-roles in studies investigating stress-related disease with discrepant differences otherwise attributable solely to sex. That higher masculinity was related to increased physical symptoms and physiological dysregulations corroborates previous research suggestive of increased susceptibilities to hyper-arousal pathologies such as cardiovascular disease in masculine-typed individuals. We postulate that inflated masculine gender-role identities may render individuals more vulnerable to physiological ailments via inadequacies to cognitively and behaviourally (e.g., hostility, avoidant coping strategies, substance abuse) adapt to chronic stressors.

Poster # 7 **Investigation of sex differences in emotional episodic memory in schizophrenia patients: an fMRI study**

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Nadia Lakis<sup>1,2</sup>, Adham Mancini-Marié<sup>1,2</sup>, José Jiménez<sup>1,2</sup>, Melissa Rinaldi<sup>1</sup>, Adrianna Mendrek<sup>1,2</sup>.

<sup>1</sup>. Department of Psychiatry, Fernand-Seguin Research Centre of Louis-H. Lafontaine Hospital, University of Montreal, QC, Canada

<sup>2</sup>. Department of Psychiatry, Biomedical Sciences Program, Faculty of Medicine, University of Montreal, Montreal, QC, Canada

**Background:** Several studies have shown that women perform better than men on emotional memory tasks (Canli et al., 2002). It has also been demonstrated that patients with schizophrenia have impairments in both emotional processing and recall (Hall et al., 2007). To our knowledge, this is the only neuroimaging study investigating the effect of sex on emotional memory (EM) in schizophrenia patients.

**Methods:** 35 men (18-patient [SZ-M];17-controls [HM]) and 29 women (16-patients [SZ-W];13-controls [HW]) were scanned during an EM task. At the beginning of the neuroimaging session all participants viewed neutral, negatively and positively charged images (Run 1) selected from the International Affective Picture System. After a 15-minute interval during which subjects performed an unrelated cognitive task, they underwent another run (Run 2) where 50% of the images were new and the other 50% of the images were old originating from Run 1. The participants' task was to determine which of the stimuli were old and which were new. Random effect analyses were performed using SPM5.

**Results:** Negative Condition-SZ-M showed decreased activations compared to HM in the right (R) inferior temporal, bilateral (B) inferior frontal cortex, B-amygdala, and R-inferior parietal cortex. SZ-W compared to HW showed decreased activations in the L-inferior occipital, L-inferior orbitofrontal, R-inferior frontal, R-middle frontal. Behaviourally, SZ-M performed significantly worse on the EM task (# correct responses; mean=30.78, SD=4.51) compared to HM (mean=35.71, SD=3.70), ( $p<0.001$ ). SZ-W also performed worse (mean=31.5, SD=5.45) relative to HW (mean=35.77, SD=2.42), ( $p<0.016$ ). No significant effect of sex on the EM task was observed.

Positive Condition- SZ-M showed decreased activations compared to HM in the L-fusiform gyrus, B-inferior frontal, R-middle frontal, B-hippocampus, L-superior parietal, R-caudate, L-thalamus and L-cerebellum. SZ-W compared to HW showed increased activations in the R-cerebellum, L-precentral, R-inferior frontal, R-hippocampus, L-thalamus, L-middle occipital. Behaviourally, SZ-M performed significantly worse on the EM task (# correct responses; mean=31.72, SD=5.09) compared to HM (mean=37.41, SD=2.79), ( $p<0.001$ ). SZ-W also performed worse (mean=30.64, SD=5.83) relative to HW (mean=37.31, SD=2.39), ( $p<0.001$ ). No significant effect of sex on the EM task was observed.

**Conclusion:** In terms of behavioural data, patients performed significantly worse than controls and no sex differences were observed in either negative or positive condition. In terms of neural activations, both male and female patients showed decreased activation during the negative condition of the EM task relative to control participants and no significant sex differences were detected. Interestingly, in the positive condition there were significant sex differences in the pattern of brain activations. Thus, while similarly to the negative condition the SZ-M exhibited diminished activations relative to HM, the opposite was true for women; SZ-W showed increased activations compared to HW. This effect is consistent with our previous findings (Mendrek et al., 2007) and provides further evidence for investigating functional neuroanatomy separately in men and women (in psychopathological and healthy conditions).

Poster # 8 **Amygdala dopamine depletion produces opposite effects on anxiety-related behaviour in male and female rats.**

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Fernand-Seguin Research Centre of Louis-H. Lafontaine Hospital, Département de Psychiatrie,  
Université de Montréal

A growing body of literature suggests that sex differences exist in both rodents and humans in terms of the central processing of stress and emotion, and an important factor in this regard may involve differential hemispheric specialization. The amygdala has been shown to be functionally asymmetrical in both rats and humans and its involvement in stress and emotion processing is well documented. Given that amygdala function is importantly modulated by dopamine (DA), the present study examined the effects of left vs. right unilateral DAergic depletion of the amygdala in male and female rats. We examined anxiety-related behaviour in the elevated plus maze over two consecutive days, and plasma adrenocorticotrophic hormone (ACTH) levels in response to a separate 30 minute restraint stress. Overall, females showed significantly more exploration of open arms of the plus maze than males, while not differing in general activity level. Significant sex x hemisphere interactions were observed for all measures related to open arm exploration, as right amygdala DA depletion produced an anxiolytic effect in males, increasing open arm exploration, but reduced this behaviour in females. Moreover, open arm exploration was greatly reduced on the second maze exposure in males, but unchanged in females. A sex x hemisphere interaction was also found for plasma ACTH levels. The data show that the same brain manipulation can have different and even opposite effects on behaviour in males and females. It is suggested that the role of amygdala DA on stress-related behaviour and physiology reflects inherent differences in amygdala function dependent on both sex and hemisphere.

Poster # 9 **Perinatal Obsessive-Compulsive Scale (POCS)**

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Lord, C.<sup>1</sup>., Rieder, A.<sup>1</sup>, Hall, G.<sup>2</sup>, Soares, C.<sup>1,2</sup>, & Steiner, M.<sup>1,2</sup>

1-Women Health Concerns Clinic, St-Joseph's Healthcare, Hamilton, Canada ,2-McMaster University, Department of Psychiatry and Behavioural Neurosciences, Hamilton, Canada

**Objective:** Several studies found that reproductive events in a woman's life, such as the postpartum period, can increase the risk of developing psychiatric conditions. The literature on postpartum onset of anxiety disorders and especially of obsessive-compulsive disorder (OCD) is scarce although it is frequently seen clinically. Obsessions and compulsions appearing following childbirth focus on the newborn and its environment creating immense distress and impairs not only the new mother's social, occupational and personal life but in this context may disrupt the essential mother-baby bonding process. Currently there is no specific tool to assess the unique content, context and severity of OCD during this sensitive period.

**Method:** We developed the Perinatal Obsessive-Compulsive Scale (POCS) to assess and better characterize obsessions and compulsions during the perinatal period. The questionnaire is 2 folded with a context-specific version for pregnant women and another for postpartum women. To this date, 35 pregnant and 59 postpartum women from studies and/or patients at the Women's Health Concerns Clinic, St-Joseph's Healthcare, Canada completed the POCS and the Yale-Brown Obsessive Compulsive Scale (Y-BOCS).

**Results:** Good correlation is obtained between the POCS and the Y-BOCS scores (prenatal POCS r: 0,81 p<0,01 and postnatal POCS r:0,47, p < 0,01). The recurrent thoughts focus on worries related to the baby's health and fear of being judged/criticized as a mother and the compulsions are in the checking spectrum. Not all women reported the onset of their symptoms, those that did reported frequent onset during the first trimester or right at the birth of the baby.

**Conclusion:** Diagnostically, the POCS appears to be as reliable as the Y-BOCS but adds both quantitative and qualitative components, which are unique to the perinatal women population. It is hoped that the POCS will help clinicians and scientists to better describe, understand, diagnose, and treat OCD during the perinatal period.

Lord, C. <sup>2</sup>, Hall, G. <sup>3</sup>, Soares, C.N. <sup>2,3</sup> & Steiner, M. <sup>2,3</sup>

1-McMaster University, Department of Psychology, Neuroscience & Behaviour

2-Women Health Concerns Clinic, St-Joseph's Healthcare, Hamilton, Canada

3-McMaster University, Department of Psychiatry and Behavioural Neurosciences, Hamilton, Canada

**Objective:** Postpartum onset of anxiety disorders, particularly of obsessive-compulsive disorder (OCD) are rarely reported in the literature although frequently observed in the clinical setting. It is observed that the obsessions and compulsions focus on the newborn and create immense distress. Research on the stress response in postpartum psychiatric populations is limited and the neural and neuroendocrine correlates to postpartum OCD is unclear. Few studies investigated the brain circuitry involved in OCD, very few included women and none in the postpartum period, and none of which focus on the stress reactivity underlying network. The purpose of this study is to examine neural activation in women with postpartum OCD and healthy women in response to a stress task using functional magnetic resonance imaging (fMRI).

**Method:** Subjects are females diagnosed with postpartum OCD and matched healthy controls. During the stress phase, functional magnetic resonance images are recorded to observe brain activity while subjects complete the Montreal Imaging Stress Task (MIST), a psychological stressor. Saliva samples are obtained before and after the stressor to assess the hormonal stress response along with subjective stress rating.

**Results:** To this date, 9 postpartum OCD women and 10 controls completed the study. Preliminary analysis show that the majority of the subjects demonstrated an increase in subjective stress rating with postpartum OCD women finding the MIST more stressful compared to controls. In response to stress we observed deactivations in the limbic system as previously reported. Interestingly, during stress postpartum OCD women seem to recruit the orbitofrontal cortex as compared to controls.

**Conclusion:** These preliminary observations are consistent with the literature and point toward a distinct stress brain activation pattern in postpartum OCD women. It is hoped that the results of this study will provide further insight into the nature of neurophysiological and neuroendocrinological involvement in postpartum OCD.

Poster # 11 **Sex differences in corpus callosum fractional anisotropy in schizophrenia patients: A pilot tractography study using Diffusion Tensor Imaging**

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Adham Mancini-Marie<sup>1,2</sup>, Julien Cohen-Adad<sup>2</sup>, José Jimenez<sup>1,2</sup>, Nadia Lakis<sup>1,2</sup>, Benjamin Stip<sup>1,2</sup>, Cheryl Corcoran<sup>3</sup>, Pierre Rainville, Emmanuel Stip<sup>1,2</sup>, Stephane Potvin<sup>1,2</sup>, Adrianna Mendrek<sup>1,2</sup>

1. Department of Psychiatry, Fernand-Seguin Research Centre of Louis-H. Lafontaine Hospital,, University of Montreal, Montreal, QC, Canada.
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4. Center of Prevention and Evaluation, New York State Psychiatric Institute, Columbia University, New York, NY, USA.

The relative size of the corpus callosum (CC) is 5% larger in normal women compared to men. Studies in schizophrenia have shown that specifically the middle section of the corpus callosum (MCC) is larger in women compared to men. Very few studies attempted to investigate if volumetric findings are substantiated with intact white matter integrity. The aim of this study is to investigate white matter tract integrity in the MCC in patients with schizophrenia compared to healthy controls using fiber tracking and fractional anisotropy (FA) analyses. We scanned 17 men and 13 women with schizophrenia and controls matched for age and sex using Diffusion Tensor Imaging (DTI). Here we present the results in 2 women and 2 men with schizophrenia compared to healthy controls (2 women and 2 men). DTI analyses were performed using MedINRIA software (<http://www.sop.inria.fr/asclepios/software/MedINRIA/>) to perform fiber-of-interest analyses using the “DTI Track module” of MedINRIA. White matter fiber tracts of MCC was created in 3D based on similarities between neighboring voxels in shape (quantitative diffusion anisotropy measures) and orientation (principal eigenvector map) of the diffusion ellipsoid. Our findings show that patients in general had lower FA, lower number of fibers and lower bundle volume compared to controls (mean volume=4098m<sup>3</sup>; mean number of fibers=373.5; mean FA=.62). Men in both groups had higher scores on the 3 items analysed except for FA which was only higher in healthy men compare to healthy women.

Our results in the schizophrenia group are in accordance with previous findings on reversed normal sexual dimorphism in these patients. Nevertheless, results for healthy controls are not in accordance with volumetric findings of the CC, and suggest that DTI approaches could lead to differential results compared to other structural methods. These results should be interpreted with caution considering the small sample size and until a complete analyses is performed on all scanned subjects.

Poster # 12 **Emotional Newspaper Headlines: Guys, you report not being concerned by them but that is not what your body reports!**

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Marie-France Marin<sup>1,2,3</sup>, Tania Elaine Schramek<sup>1,2,4</sup>, Annick Beaupré<sup>1</sup>, Andrea Perna<sup>1</sup>, Robert-Paul Juster<sup>1,2,4</sup> & Sonia J. Lupien<sup>1,2,3</sup>

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3- Université de Montréal

2- Fernand-Seguin Research Centre of Louis-H.

4- McGill University

**RATIONALE & OBJECTIVES:** Sex differences exist in subjective and objective measures of stress, where women report greater distress while men show greater stress reactivity. Problematically, research assessing the impact of stress on emotional memory generally only focus on the objective measure of stress in artificial contexts. Different laboratory paradigms have used stimuli such as words, pictures and stories to vary emotional valence, however the ecological validity of this methodology is unascertained. In the aims of augmenting the realism of emotional stimuli within the context of stress reactivity paradigms, we decided to use newspaper headlines. The goal of this project was to assess whether reading newspapers was stressful in terms of objective measures and subjective ones and whether this varies as a function of sex and valence of the titles.

**METHODS:** Healthy men and women aged 18 to 35 were exposed to either 24 neutral or 24 emotional newspaper headlines for 10 minutes while salivary cortisol levels were collected before and after the task. Twenty-four hours later, they were asked to freely recall as many headlines as possible. Subsequently, every headline was read to them and they were asked to rate its emotionality and the extent to which they were concerned by the news using scales from 1 to 5.

**RESULTS:** Irrespective of sex, emotional headlines were rated as being more emotional than neutral ones, demonstrating the validity of this new paradigm. Women in the emotional condition were significantly more concerned by the news and recalled significantly more newspaper headlines compared to women in the neutral condition. However, reading emotional headlines did not translate into cortisol elevations in women. On the other hand for men, the ratings of concern and the recollection for the emotional headlines did not differ from the neutral ones. However, men who were exposed to emotional headlines had an elevation in cortisol levels following the task, which was not observed in any other group.

**DISCUSSION:** These findings are in accordance with the literature where men seem most reactive in terms of objective physiological measures whereas women report being more concerned as evidenced by higher scores on subjective measures. These preliminary results point to the importance of assessing both subjective self-reported measures as well as objective measures when teasing apart sex differences in stress research. Given that a benign activity like reading a newspaper can elicit a stress response, this study highlights the importance of developing paradigms sensitive to the real world experiences of individuals.

Poster # 13 **Interaction effects between the quality of the parent-child relationship and correlates of internalizing disorders in adolescents in Quebec**

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Martin, Andrea<sup>1,3</sup>, Smolla, Nicole<sup>1,2,3</sup>, Tousignant, Michel<sup>3</sup>, Bergeron, Lise<sup>1,2</sup>, Berthiaume, Claude<sup>1</sup>

1 Research Unit, Rivière-des-Prairies Hospital, Fernand-Seguin Research Centre of Louis-H. Lafontaine Hospital,

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**Objectives:** To evaluate interaction effects between the parent-child relationship and correlates of internalizing disorders (ID) in adolescents. No study to date has examined these effects in a representative sample. **Method:** Using DSM-III-R criteria, simple phobia, separation anxiety, overanxious/generalised anxiety, depression, and dysthymia disorders were assessed in 825 adolescents from the Quebec Child Mental Health Survey (1992, n=2,400). A multivariate logistic regression model was built, with the presence of at least one ID (parent informant) as the outcome variable. Predictors were individual, family, and socio-demographic characteristics, and the interactions of these variables with the parent-child relationship. **Results:** Main effects were found for chronic physical illness, ordinal position, parental psychopathology, and father's punitive behaviours. Interaction effects were found for: (1) age x father's caring behaviours, (2) gender x mother's caring behaviours, (3) social competence x mother's caring behaviours, (4) mother's education x mother's autonomy promoting behaviours, and (5) mother's education x father's autonomy promoting behaviours. **Conclusions:** "Objective" variables such as age, gender, and mother's education interact with the parent-child relationship in the prediction of adolescent IDs. In those interaction effects, high or low autonomy promoting and caring behaviour scores are both associated with an increased risk of adolescent IDs. Due to the inclusion of the adolescent's own perceptions of the parent-child relationship, it was possible to reveal the importance of this variable in the multivariate model.

Poster # 14 **Programs to improve responses to men help seeking behaviour could be enhanced with a theory driven approach.**

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Men help-seeking behaviour is sometimes associated with aggressive behaviour. These aggressive behaviours can elicit frustration from others and few helping behaviour. To improve this situation, the program Acc/Sais Cible Homme was designed by a community organization to increase comprehension about men help-seeking behaviour.

This program was evaluated using a preexperimental one group pretest post test design. The program involved the training of 85 unspecialized workers in mental health but delivering services to men with social or economic problems. The evaluation used a theory driven approach to set with the organization realistic goals about the program effectiveness. Targets of effectiveness were selected as they were related to knowledge, attitudes and intention to refer suicidal men to mental health resources.

Results show an improvement concerning knowledge of suicidal behaviour and intention to refer suicidal men. Attitude toward suicidal men were more comprehensive but some participants were reluctant to change their attitudes toward suicidal men with aggressive behaviour. Men and women show similar reaction to the program in knowledge, attitudes and intention to refer. Despite the methodological limitations of this evaluation, these results suggest that program effectiveness and evaluation could be enhanced with a theory driven approach.

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**Background:** Evidence shows that sex differences exist in response to stress. Young men show higher cortisol levels in response to psychosocial stress tasks and the anticipation of psychosocial stressors. Higher cortisol levels impair cognitive performance, however it is unknown whether testing environments themselves might function as stressors. The goal of this study was to assess whether sex differences exist in stress responses to testing environments manipulated to induce higher or lower distress for young adult university students.

**Methods:** Eight male and twenty female ages 18 to 35 were each tested in three different conditions: 1) Montreal Neurological Institute (MNI - ↓ stress) on university grounds in the afternoon and tested by a young graduate student; 2) Douglas Hospital (DH - ↑ stress) far from the university in the morning and tested by an older adult; 3) Douglas Hospital re-visit (DH-R - ↑ stress) for exposure to a validated psychosocial stress task. Salivary cortisol was repeatedly measured in all conditions.

**Results:** Repeated measures ANOVAs were performed with sex as the between subjects factor and cortisol samples as the dependent variable. MNI (↓ stress) males secreted significantly higher cortisol levels than females ( $F(1, 26) = 10.535, p = .003$ ). DH (↑ stress) males and females did not significantly differ ( $F(1, 26) = .089, p = .768$ ). DH-R (↑ stress) males indeed showed a higher cortisol response; however this was not significant ( $F(1, 26) = 1.213, p = .281$ ).

**Conclusions:** Men showed a significantly higher cortisol response in the least stressful testing environment, the MNI. These results may be consistent with previous findings, indicating that men have interpreted the testing session as a stressor and reacted more to compared to women. Conversely, in the stressful conditions in the morning (DH), both males and females had a high cortisol response due to the time of the day and due to the testing conditions. Future studies are needed in order to assess whether the higher cortisol levels in men at the MNI are due to higher basal cortisol levels or whether it was a response to the testing condition.

Poster # 16 **School failure at the beginning of the elementary school: should we have to be concerned for girls like boys?**

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Geneviève Trépanier, student in psychology (UQAM)

Marc Bigras, professor at the department of psychology (UQAM)

School achievement is probably the most important determinant/outcome of mental health at childhood but this issue is rarely considered from a gender perspective. For example, we know that boys are up to 4 times more at the risk to have early school difficulties compared to girls. However, this rate drops to twice at high school. Is that means an under detection of girl's early school related difficulties? Is there a set of risk factors or protection factors for school success different according to gender or screening criterias are inadequate for girls? To answer these questions, we followed kindergarders (T1, n=384) until the end of the first years of elementary school (T2). We assessed variables at T1 like IQ, school readiness social affective profil of the children, parental stress, sociodemographics data such as income schooling of the mother and of the father, etc. At T2, we measured indicators of school success like school tests standardized and a teacher ratings. Variables at T1 classify 89% of boys and 95% of girls in the success/failure category at T2. These predictors are social competence, aggressiveness, anxiety, parental stress, school maturity, schooling of the mother and of the father, family income, favourable and unfavourable school recalls of the mother. Boys and girls have the school readiness as a common predictor, but the results indicated differences between boys and girls for the major predictor for school failure. For boys the strongest predictor is aggressiveness and for girls it's anxiety. Moreover, we see differences in the threshold of school readiness. With a cutting point at 46 on the measure of school readiness using the Lollipop test we classified 81% of boys in true positive and 31% in false positive for school failure. This cutting point has to be upgrade to 49 for girls for a same level of detection and specificity. These results could be used for the improvement of detecting protocols of early school failure according to gender and to offer more adapted services. Indeed, these results suggest a that intervention might take in account gender of child because of possible determinant/outcomes specificity.

Poster # 17 **Sex and Gender Differences in Depressive Symptomatology and Stress Hormone Levels: An Intriguing Time of Day Effect**

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**Introduction:** Chronic stress is associated with the onset of depression among adolescents (1,2). Prevalence rates for depression diverge between the sexes during this period as females become two times more likely to be afflicted (3,4). Distress and the associated elevations of the stress hormone cortisol are important risk-factors for clinical depression (5). Because cortisol fluctuates diurnally, time of measurement can confound interpretations, and yet no studies have assessed time of day effects on testing for depression. Concordant with existent literature, we hypothesized that; 1) girls would have significantly higher Child Depression Inventory (CDI) scores and higher cortisol levels than boys, regardless of the time of day, 2) high CDI scores will be correlated with high cortisol levels in both genders, regardless of the time of day.

**Method:** We tested 226 students between the ages of 11 and 13, in groups of 25 in classrooms. At the physiological level, we measured levels of the stress hormone cortisol in saliva samples, while at the psychological level, we measured depression scores using CDI. These outcome measures were assessed in three time blocks; block 1 (10:00AM to 12:00PM), block 2 (12:00PM to 2:00PM), and block 3 (2:00PM to 4PM).

**Results:** Girls had significantly higher cortisol levels than boys in blocks 1 and 3, but not in block 2. Boys scored significantly higher than girls on the CDI in block 1 but not in blocks 2 and 3. Finally, the CDI correlated inversely with cortisol levels for girls in block 1, but no other sex associations were found.

**Conclusion:** As hypothesized, girls had significantly higher levels of circulating cortisol than boys in block 1 and 3, but it is not clear why no differences were detected in block 2. It may be due to a time of day effect, which will be examined in future repeated measures analyses. Boys scored significantly higher than girls on the CDI in block 1 but there was no relationship to higher levels of cortisol as originally predicted. We are currently continuing testing and will corroborate these findings with an expected sample size of 800.

# Contact List

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