

Prenatal exposure to serotonin reuptake inhibitor antidepressants (pSRI) and maternal depression may be two early life events that shape prefrontal cognitive skills termed executive functions (EFs) central to attention, reasoning and self-control. Genetic variations in SLC6A4, a gene that codes for the membrane-bound serotonin transporter (5HTT) protein, also affects behavioral regulation. To look at longer-term effects of pSRI-exposure and whether such effects are moderated by SLC6A4 genotype, pSRI-exposed (N=26) and non-exposed (N=38) children (mean age 6.33 years) were studied using the Hearts and Flowers task to assess EFs, with trials treated as a repeated within-subject variable, and maternal mood (Hamilton Depression Scale: 3rd trimester and 6 years) as covariates. On the task block most demanding of EFs, children whose mothers were more depressed during pregnancy made more errors, regardless of SRI exposure. Within the pSRI-exposed group, (a) children whose mothers were currently more depressed performed better, while (b) children with 2 long alleles erred more than those with > 1 short SLC6A4 allele. Non-pSRI-exposed children with > 1 short allele erred more than those with 2 long alleles, controlling for prenatal and current maternal mood (the reverse of pSRI-exposed children). Prenatal maternal depression was associated with poorer EFs, regardless of pSRI exposure. Prenatal SRI exposure was associated with better EFs if and only if the mother was currently depressed or the child had 2 short SLC6A4 alleles. Better cognitive control in those with reduced 5HTT expression (s allele) and prenatal SRI exposure may reflect an increased sensitivity to early serotonergic programming.

Contract grants: CIHR grant to TFO

#### EARLY LIFE STRESS, THE DEVELOPMENT OF PHYSIOLOGICAL STRESS SYSTEMS, AND POTENTIAL TRAIT PERSONALITY MODERATORS

K. M. O'Brien and C. L. Moore

Department of Psychology, University of Massachusetts, Boston, 02125  
Kymberlee.obrien@umb.edu

Both animal and human research suggests that early life stress has lifetime influences on the development of physiological stress systems, such as HPA axis functioning. In the human literature, early stress has included parental abuse and/or neglect, and in addition to disrupting physiological development, early environment has been found to influence psychological well-being and emotional regulation. In the present study, we report evidence from the MIDUS biomarker project (N=1255, age 34–84, M=54.52, SD=11.71) that suggests predictive relationships between physical, emotional, and sexual abuse in the etiology of depression and anxiety in adulthood. Moreover, experiencing physical abuse in early life was moderated by trait anger disposition in higher autonomic stress reactivity for both cognitive and social stress tasks. Those who were low in trait anger, but experienced physical abuse, showed sympathetic reactivity similar to those with low abuse. The present results confirm prior findings that adult offspring from multiple forms of abuse are at risk for major pathophysiology and illness. Personality factors, including trait anger and trait anxiety may moderate these pathways. In addition, these findings suggest that unique early life adversity can influence both acute stress reactivity, as well as the trajectory of major psychiatric illnesses related to biological development.

#### SUBJECTIVE AND OBJECTIVE SOCIOECONOMIC STATUS INFLUENCES DIFFERENTIAL AUTONOMIC STRESS REACTIVITY

K. M. O'Brien and C. L. Moore

Department of Psychology, UMASS, Boston, 02125  
Kymberlee.obrien@umb.edu

Decades of research have elucidated that social status influences health on a gradient. Precise mechanisms, however, are multicomponential, including psychological, environmental, and physiological systems. With a sample of 96 healthy adults (ages 18–80; M=53, SD=11), we investigated one specific mechanism from status to health, as indexed by physiological responsiveness. Levels of socioeconomic status (SES) were compared to subjective social status ratings (U.S. SSS) during a modification of the Trier Social Stress Task. In the present study, participants were randomly assigned to a control, positive, or negative social feedback condition. Cardiovascular and neuro-

endocrine parameters were measured throughout the experiment. Each status measure, objective versus subjective predicted a unique constellation of physiological reactivity to stress, perceived psychological resources and changes in affect. Specifically, SES was negatively correlated with vagal tone and baseline negative affect; low SES predicted greater increases in sympathetic reactivity to the negative, most stressful social feedback condition, but faster recovery. In contrast, those with low SSS showed decreases in parasympathetic reactivity during the stress task and the least vagal rebound when in the highest stress condition. This was also related to greater psychological threat. Overall, in these data, it appears that the SES measured was associated with sympathetic activity, whereas the SSS measure was associated with parasympathetic activity. The implications of using subjective or objective measures to assess autonomic reactivity and recovery as well as psychological coping with social stressors are discussed.

#### INCREASED OPPORTUNITIES TO INTERACT WITH THE MOTHER AFFECT RESPONSES OF PIGLETS TO WEANING AND A CHANGE OF ENVIRONMENT

M. Oostindjer, H. van den Brand, B. Kemp, and J. E. Bolhuis  
Adaptation Physiology Group, Wageningen University, Wageningen, The Netherlands  
marije.oostindjer@wur.nl

We investigated effects of increased opportunities to interact with the mother on the ability of piglets to cope with weaning stress and a change in environment from barren to enriched or vice versa. Piglets were housed in barren or enriched pens with their mother confined in a farrowing crate or loose-housed preweaning. Enrichment consisted of increased space allowance, straw, wood shavings, peat and branches. Piglets were weaned at d 29 and relocated to a barren or enriched pen (2 × 2 × 2 factorial arrangement, eight treatments, eight pens per treatment, four pigs per pen). Behavior was recorded on d 1, 5, 9 and 12 postweaning. Weanling piglets from loose-housed sows showed less damaging behaviors directed at pen mates than piglets from confined sows (belly nosing: 0.3 versus 0.7%,  $p=0.04$ ; other oral manipulative behaviors: 0.8 versus 0.9% of observations,  $p=0.05$ ) and more play behavior (0.9 versus 0.7%,  $p=0.02$ ). Piglets from a loose-housed sow switching from a barren to enriched environment showed the highest levels of play behavior (1.8%) and lowest levels of belly nosing (0.03%) while piglets from a confined sow switching from an enriched to a barren environment showed highest levels of belly nosing (1.6%,  $p=0.09$ ) and low levels of play (0.1%,  $p=0.04$ ). Having more opportunities to interact with the mother before weaning seems to buffer the detrimental effects of weaning and of changing from an enriched to barren environment in piglets. It also increased the positive response to obtaining environmental enrichment, suggesting the mother positively affects stress-resilience or emotional state. [NWO-STW grant 07722].

#### NEUROCOGNITIVE DEVELOPMENT OF INFANTS WITH PRENATAL METHADONE EXPOSURE

J. A. Paul,<sup>1</sup> B. A. Logan,<sup>2</sup> N. A. Heller,<sup>2</sup> R. Krishnan,<sup>3</sup> and M. J. Hayes<sup>2,4</sup>

<sup>1</sup>Obstetrics and Gynecology, University of Texas Medical Branch, Galveston, TX 77555

<sup>2</sup>Psychology, University of Maine, Orono, ME 04469

<sup>3</sup>Pediatrics, University of Tennessee Health Science Center, Memphis, TN 38163

<sup>4</sup>Maine Institute for Human Genetics and Health, Bangor, ME 04401  
japaul@utmb.edu

Prenatal opiate exposure affects central nervous system development, and may place infants at risk for poor neurocognitive development. The event-related potential (ERP) is an electrical potential measured at the scalp using electroencephalography corresponding to cortical information processing. The oddball paradigm, in which a train of a repeated stimulus is randomly punctuated with a different stimulus, is commonly used to elicit an ERP. This elicits a positive voltage deflection at 150–400 ms post-stimulus known as the P2, and increased amplitude to the oddball stimulus measures the attentional orienting response. A Positive Slow Wave (PSW) occurring at 1000–1400 ms