Background
Previous research suggests obesity is negatively related to cognitive functioning and academic outcomes in addition to physical health. However, not much is known about this association in early childhood or potential physiological underpinnings. Biomarkers related to obesity have been associated with cognition, in particular the adipokine leptin, and pro-inflammatory cytokines including interleukin-6 (IL-6), tumor necrosis factor-alpha (TNF-alpha) and C-reactive protein (CRP). These associations may be further exacerbated for children who experience early life stress. Miller and colleagues (2013) found significant associations between physiological markers of early life stress, obesity, and behavioral school readiness in a sample of low-income preschoolers.

Study Aim
The current study aims to extend findings from Miller and colleagues (2013) by examining multiple components of school readiness collected from Head Start records. In addition, as a post hoc aim we consider associations with early life stress exposure.

Sample
Convenience sample (n = 66) from the Healthy Kids study (N = 175) recruited from Head Start
- Ages: 26.8-50.24 mos
- 76% Male

Method
School Readiness
- Children’s Behavior Questionnaire- Short Form (Rothbart et al., 2001)
  - Inhibitory Control
  - Attentional Focusing
  - Low Intensity Pleasure
  - Perceptual Sensitivity
- Desired Results Developmental Profile-Cognitive Development Scale (California Department of Education, 2010)

BMI z-score
- Assessed with researcher-measured height and weight using CDC growth charts for age & gender

Biomarkers (leptin, IL-6, TNF-alpha, CRP)
- Assessed with blood samples collected from fasted children measured by electrochemiluminescent immunoassay and turbidimetric assay

Early Life Stress
- Sum score of early life stress exposure
  - Household income (reverse coded, 6 = $20k/year to 1 = greater than $40k/year)
  - Marital status (coded 1 = single parent, 0 = non-single parent)
- Participation in assistance programs (# of programs)

Hypotheses

Results: Main Aim
Analyses were conducted using partial correlations with child age in mos. as a covariate

Results: Post Hoc Aim
Analyses were conducted using Analysis of Covariance with child age in mos. as a covariate

Conclusions
Findings suggest connections between obesity, physiology, and school readiness need further examination, but may have implications for early childhood education and health interventions.

Outreach efforts that focus on promoting skills implicated in school readiness, such as inhibitory control, in children with early childhood obesity may improve school outcomes given that underlying physiological differences associated with obesity could create barriers to learning.

Contact: Carolyn Sutter
carolyns@illinois.edu

Funding
Supported by Agriculture and Food Research Initiative #2015-68001-23280 from the USDA National Institute of Food and Agriculture, Human Nutrition and Obesity 93330.