relate these changes to other health-related outcomes, including weight loss and glycemic control.
**Results:** Bariatric surgery was associated with a reduction in cerebral Cho ($t$[34] = -3.79, $p$ < 0.001, $d$ = -0.64) and mI ($t$[34] = -2.81, $p$ < 0.01, $d$ = -0.47) concentrations. There were no significant changes in NAA, Glx, or Cr concentrations. Reductions in Cho were associated with greater weight loss ($r$ = 0.40, $p$ < 0.05), and reductions in mI were associated with greater reductions in $HbA_{1c}$ ($r$ = 0.44, $p$ < 0.05).
**Conclusions:** Participants who underwent bariatric surgery exhibited reductions in cerebral Cho and mI concentrations, which were associated with improvements in weight loss and glycemic control. Given that elevated levels of Cho and mI have been implicated in neuroinflammation, reduction in these metabolites after bariatric surgery may reflect amelioration of obesity-related neuroinflammatory processes. As such, our results provide evidence that bariatric surgery may improve brain health and metabolism in individuals with obesity.

**Categories:** Neuroimaging
**Keyword 1:** magnetic resonance spectroscopy
**Keyword 2:** medical disorders/illness
**Correspondence:** Sarah Bottari, University of Florida, sbottari@ufl.edu

## 54 Exploring the Impact of Stria Terminalis Connectivity and Family Income on Depressive Symptoms Throughout Development

Sophie I Leib[1], Whitney I Mattson[2], Eric E Nelson[2,3], Young Jin Kim[2], Kristen R Hoskinson[2,3]
[1]Nationwide Children's Hospital, Columbus, OH, USA. [2]Center for Biobehavioral Health, Abigail Wexner Research Institute at Nationwide Children's Hospital, Columbus, OH, USA. [3]Section of Pediatrics, The Ohio State University College of Medicine, Columbus, OH, USA

**Objective:** The stria terminalis (ST) is a white matter tract with connections to limbic and autonomic brain structures that is implicated in affective functioning. Recent works suggests that ST functional integrity and connectivity is associated with faster responses to emotional cues (Dzafic et al., 2019) and may be influenced by environmental factors including socioeconomic status (SES) and childhood adversity (Banihashemi et al., 2020). The role of the ST in the experience of more daily affective experiences, such as depressive symptoms, remains unexplored. Therefore, the present study examined the role of the ST and SES, as assessed by household income, in the relationship between age and depressive symptoms in typically developing children and adolescents.
**Participants and Methods:** Participants include 64 typically developing children and adolescents age 8-21 (Mage=13.27, SD=3.15) who participated in an ongoing study of development of neurocognitive and social-cognitive skills. Participants completed imaging on a 3Tesla MR Siemens PRISMA scanner. Tractography was executed via ENIGMA tract-based spatial statistics to quantify WM integrity and provided values for mean fractional anisotropy (mFA) of the ST. Depressive symptoms were measured with the Behavior Assessment Scale for Children-Third Edition (BASC-3) parent report scale, and annual family income was obtained per parent report. Mediation and moderation analyses were conducted using Process version 4.1 (Hayes, 2022) in SPSS version 28. As depression symptoms are often higher in early adolescence than later, we examined the indirect effect of age on depressive symptoms through ST mFA and evaluated this relationship at different levels of family income.
**Results:** Age was associated with lower levels of depressive symptoms (b=-.98, t=-2.18, p<.05), whereas greater right ST mFA was associated with higher levels of depressive symptoms (b=42.05, t=2.50, p<.05). Right ST mFA explained significant variance in the relationship between age and parent-reported depression (ab=.13, 95% CI [.02, .29]). The conditional indirect effect of family income was significant for children with annual family incomes between 25-50k (effect=.16, 95% CI [.01, .38]) and 75-100k (effect=.13, 95% CI [.001, .31]), but not for 100k+ (effect=.11, 95% CI [-.05, .33]).
**Conclusions:** The present study revealed a significant, positive relationship between white matter integrity in the right ST and parent-reported depressive symptoms in healthy children and young adults. Finding extend on prior work implicating the ST in threat responsivity (Dzafic et al., 2019). Moreover,

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results suggest the role of the ST in the relationship between age and depression depends on level of family income, such that ST mFA explains more variance at lower income levels, and is no longer significant for children from families with income greater than 100k. These findings support the notion that environmental stressors (such as lower family income) may strengthen ST pathways via activity-dependent plasticity and repeated, coordinated activation (Rinaman et al., 2011). Future studies should examine these brain-behavior associations, as they may replicate in a larger sample, with more nuanced indicators of environmental stress.

**Categories:** Neuroimaging
**Keyword 1:** neuroimaging: functional connectivity
**Keyword 2:** social processes
**Correspondence:** Sophie I. Leib, Nationwide Children's Hospital, Sophie.Leib@Nationwidechildrens.org

## 55 Within-Individual BOLD Signal Variability During a Letter N-Back Task: Implications for a Verbal Fluency Network

Stephanie N. Steinberg, Jeffrey G. Malins, Tricia Z. King
Georgia State University, Atlanta, GA, USA

**Objective:** Functional magnetic resonance imaging (fMRI) research has generally focused on drawing conclusions from average brain activation patterns. Importantly, the brain is inherently variable; growing literature has found that within-individual blood oxygen level-dependent (BOLD) signal variability may be meaningful, and not just "noise." For example, recent research has identified increased BOLD signal variability in healthy younger and older adults during more effortful/complex task loads of n-back paradigms, commonly used tasks that involve important elements of executive function (e.g., attention, working memory, planning, inhibition, etc.). Verbal fluency is a complex cognitive domain that also involves similar processes to generate words given certain rules. As a result, the current study builds on existing literature to investigate within-individual BOLD signal variability patterns in peak coordinates of a verbal fluency network during different loads of a letter n-back task. Due to greater executive demands, greater variability was expected during more effortful/complex n-back task loads in regions of a verbal fluency network.
**Participants and Methods:** Forty-eight healthy young adults ($M_{age}$(SD) = 22.41(4.47), 25 females) from the Atlanta area completed a letter n-back task in an MRI scanner. After standard processing in AFNI, images were corrected for motion and physiological artifacts, which may be confounding sources of variability. Volumes associated with each load of the letter n-back task (0-back, 1-back, 2-back, 3-back, crosshair) were identified. Task runs were normalized and respective run means were subtracted prior to concatenating all runs for each load type. Standard deviations were calculated across this mean-run corrected time series. Ten peak regions of interest (ROIs) were identified from a verbal fluency network generated from 84 peer-reviewed publications for this domain gathered on NeuroSynth. Paired samples t-tests with Benjamini-Hochberg correction for multiple comparisons were conducted to explore differences in variability during n-back task loads.
**Results:** In several of the verbal fluency network ROIs, within-individual BOLD signal variability was significantly greater for 2-back *versus* 0-back loads with medium to large effect sizes ($p$'s < .001 - < .01, Cohen's $d$ range: .53-.93). Variability was also significantly greater for 3-back *versus* 0-back loads with small to medium effect sizes ($p$'s < .001 - < .01, Cohen's $d$ range: .48-.74). Specific regions that evidenced this pattern included ROIs in the left inferior frontal gyrus, left cingulate, right inferior frontal gyrus, left middle frontal gyrus, and left superior parietal lobule. Only two regions demonstrated increased variability in the 1-back load *versus* crosshair (left middle frontal gyrus, $p$ < .001, $d$ = .63; left lentiform nucleus, $p$ < .05, $d$ = .42). No regions demonstrated a significant difference in variability in the 0-back load *versus* crosshair.
**Conclusions:** This study contributes to growing literature examining within-individual BOLD signal variability in healthy individuals by exploring variability patterns in a verbal fluency network. The observed pattern of results supports the hypothesis and is in line with previous research, demonstrating that greater variability occurs with greater executive task demands. Future research can use an in-scanner task of verbal fluency and can extend

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