DCNL Lab News!

From Dr. Elizabeth Sowell & the DCNL team at USC and Children’s Hospital Los Angeles

Dr. Elizabeth Sowell and her team of faculty, students, post-doctoral fellows, and staff are excited to share our new findings and other news of the lab! As Professor of Pediatrics at the USC Keck School of Medicine and director of DCNL, Dr. Sowell is looking forward to a new year of research at Children’s Hospital Los Angeles. Look inside for a round up of our recent publications and a current list of ongoing studies!

More inside!
Gender differences, the brain and risk-taking behaviors in adolescents

Christina Chen, Megan M. Herting, Elizabeth R. Sowell

Past research shows that risk-taking behavior is higher in males compared to females and higher in older adolescents compared to younger counterparts. The neurotransmitter dopamine has been linked to risk-taking behavior in animals and humans. In our study, we examined the areas of the brain known to be rich in dopamine levels to determine if they are related to risk-taking.

Fifty-eight boys and girls took risk-taking behavior questionnaires and received brain scans using an MRI. Our results showed a relationship between two significant brain regions (nucleus accumbens and medial orbitofrontal cortex) and taking risks.

FUNDING:
R01 MH087563
F32 HD078084

Age and gender differences on adolescent performance of varying task difficulty

MM Herting, SC Nuñez, C Chen, P Gautam, M Orozco, ER Sowell

In a task known as Go-Nogo, participants are asked to press a button in response to a particular image (Go) and try to avoid pressing the button for another image (Nogo). In this study, we want to see how age and gender makes a difference when this task starts getting harder.

We tested 69 adolescents on this task by asking the child to press a button every time they see Sponge Bob Square Pants appear on the screen and to not press any buttons when they see Patrick appear.

In our results, we saw that both boys and girls performed better with age, but girls made fewer errors compared to boys. The girls continued to improve across adolescence as the task gets harder. Boys, on the other hand, improved with age regardless of how difficult the task was. These differences between boys and girls may be related to impulsive, risk-taking behaviors and further research could help us understand why these differences exist.
Reading Skill and Brain Development

Suzanne M. Houston, Catherine Lebel, Tami Katzir, Franklin R. Manis, Eric Kan, Genevieve G. Rodriguez and Elizabeth R. Sowell

This research was supported by NIMH 5 R01MH087563-04 and NICHD 7 R01HD053893-05.

The ability to read requires many parts of the brain working together. In our study, we wanted to investigate how changes in the brain are related to children’s reading skills. We tested 16 kids on reading and scanned their brains to see if we could see a relationship.

We tested reading skills in three ways: how good kids were at remembering words, how fast they can read, and how good they were at pronouncing words.

We found out that when there was a decrease in brain volume, kids performed better at naming, reading, and fluency, regardless of age. This may be because as the brain gets older, it gets better at doing what it is supposed to do so it needs less gray brain tissue.

This could help us understand what makes reading harder for some kids and use this information to create intervention programs.

Current Studies

Collaborative Initiative on Fetal Alcohol Spectrum Disorders (CIFASD)

Sponsored by NIAAA

Typically developing children & children exposed to alcohol prenatally, ages 10-16. Participation involves MRI scans of the brain and 8 hours of tasks over 2 days.

Magnetic Resonance Images of the Brain of Adolescents

Sponsored by the NIMH

Healthy children and adolescents ages 9-18. Participants will complete 3 MRI scans of the brain & 8 hours of cognitive tasks. We look forward to seeing you soon!

Autism Spectrum Disorders Study

Sponsored by the Southern California Clinical and Translational Science Institute

Typically developing children and children with Autism 6-8 years of age. Participation includes MRI scans, sensorimotor tasks, and memory games.

Interested in one of our studies? Give us a call: (323) 361-7756. Compensation is $20/hour (NIMH & CIFASD) and children will receive a picture of their brain!

This picture shows the parts of the brain that are related to reading skills. We did not see changes in the gray area, but we found different changes in the red, green, and blue areas, depending on the type of reading skill we were testing.
Prenatal alcohol exposure (PAE) can change the structure of specific brain regions. These changes are associated with impairments in neurocognition, self-regulation, and adaptive functioning. In our study, we examined how PAE affects white matter tracts in the brain differently for boys and for girls.

We analyzed 142 brain scans taken at Children’s Hospital Los Angeles or at the University of Cape Town in South Africa. Our results showed differences in the right anterior thalamic radiation and in the forceps minor in boys and in girls who were exposed to alcohol before birth compared to those who were not exposed.

This work was funded by CIFASD and NIAAA F32 AA022561 to Kristina Uban.

For the first time, researchers from our group has found that children with fetal alcohol spectrum disorders (FASD) showed weaker brain activation during specific cognitive tasks than kids who were not exposed to alcohol before birth. We used MRI brain scanning to look at brain activation over two years. We found that even though the two groups did not differ in task performance, there were significant differences in brain development, especially in the front, temporal and parietal brain regions.

This study was recently published in Cerebral Cortex and featured in The Telegraph, Science Daily, and other news sources!

Funded by CIFASD and NIAAA.

As always, we thank you for your involvement in our research studies and hope to see you again soon! If you have any questions, please feel free to call us at (323) 361-7756.