

spherectomy. We report two cases, Katie and Emily, who developed Rasmussen's encephalitis at about 10 years of age and underwent hemispherectomy at age 13 and 14:11, respectively. Pre-operative verbal IQ was low average to average (Katie, Emily: 102, 80), and performance IQ was low to low average (Katie, Emily: 85, 67). Copy of the Rey Figure showed good reproduction of the overall structure and its relational components but delayed recall was severely impaired in both cases (Katie, Emily: copy = 28,18/36; recall = 10, 3.5/36). Two-three years post-operatively, Katie's verbal IQ had declined by 13 points, but Emily's had remained stable. In contrast, Katie's performance IQ had declined by 11 points, but Emily's had increased by 31 points to fall in the average range. For both children there was substantial improvement in the copy and delayed recall of the Rey Figure. Clear impairments in visuospatial processing were demonstrated only on a few measures (e.g., Mooney's Closure Test, Benton's Test of Line Orientation) and not on several others (e.g., face matching). These results suggest that the specialized visuospatial functions of the right hemisphere have not become firmly established by the first decade of life. More impressively, the lone left hemisphere is capable of improving some aspects of visuospatial functions late during childhood.

D30 DORSOLATERAL PREFRONTAL CORTEX DYSFUNCTION IN HEALTHY AGING AND EARLY-STAGE

Ajay Satpute, Todd Braver, Deanna Barch; Washington University, St. Louis – Previous computational modeling and behavioral studies suggest that dorsolateral prefrontal cortex (PFC) subserves context processing functions, and that these functions are particularly critical in task situations where context must be internally represented and actively maintained over extended periods of time. We tested how these context processing functions of dorsolateral PFC are affected by healthy and demented aging. Subjects (young: N=51; healthy-old: N=89; early-stage DAT: N=33) were tested in a task paradigm that we have developed as a selective probe of context processing and dorsolateral PFC function. This paradigm, known as the AX-CPT, provides selective measures for examining context processing functions, and for dissociating the internal representation and maintenance of context. Behavioral performance was assessed in all subjects, and brain activity (measured with fMRI) was assessed in a subset of young and healthy older adults. Results indicated that healthy older adults suffered from behavioral impairments in context processing and from selective dysfunction in dorsolateral PFC. Individuals with early-stage DAT showed a behavioral pattern indicating a more severe deficit. More importantly, DAT individuals showed that the context processing impairment interacted with active maintenance demands, whereas in healthy older adults there was no effect of active maintenance. These results are interpreted in light of a computational model positing different neural mechanisms for context representation and maintenance.

D31 NEURAL CORRELATES OF TARGET AND NOVELTY PROCESSING DEFICITS IN SCHIZOPHRENIA

Teresa Mitchell, Seniha Inan, Aysenil Belger; University of North Carolina at Chapel Hill – Functional integrity of the fronto-striatal circuitry involved in target and novelty processing was investigated in and compared across healthy controls, individuals prodromal for schizophrenia, and individuals diagnosed with schizophrenia. Participants completed a visual oddball task and an auditory mismatch task in an event-related fMRI paradigm. Ten functional runs were completed (parameters: 16 oblique axial EPI images, 5mm thick, in-plane resolution of 3.75 mm, TR = 1.5 seconds) in which participants were presented with visual Targets (3% frequency), Standards (94% frequency), and Novels (3% frequency) and auditory Standards (90% frequency) and Deviants (10% frequency). The first 7 runs comprised the visual oddball task, in which participants attended only to the visual stimuli. Analyses were carried out on the MFG, IFG, ACG, basal ganglia, hippocampus, and thalamus. Preliminary results show

that, in healthy controls, Targets evoked greater activation than Novels in all regions but the IFG. Both patient groups activated similarly to controls to Targets, but less than controls to Novels. In the auditory mismatch task, participants attended only to the auditory stimuli across the 3 final functional runs. Analyses included the STG. In healthy controls, attended Deviants activated all ROIs, while unattended Deviants activated only the STG. Prodromal patients activated similar to controls, while schizophrenia patients activated less to attended Deviants. These results suggest that deficits in Target detection associated with schizophrenia are greater in response to auditory than visual stimuli, that Novelty processing is also deficient, and that these deficits may be exacerbated over the course of the disorder.

D32 INHIBITORY CONTROL AND FUNCTIONAL COMPENSATION IN THE FRONTAL LOBES: A FOLLOW-UP EVENT-RELATED FUNCTIONAL MRI STUDY

Scott Langenecker¹, Kristy Nielson²; ¹University of Michigan Medical Center, Ann Arbor, ²Medical College of Wisconsin, Milwaukee – A decline in inhibitory control, a fundamental executive function, has been proposed as a possible cause for decreased memory efficiency in older adults. The neuroimaging literature examining cognitive aging is small, but across tasks has suggested that older adults have increased bilateral activation, particularly in the frontal lobes. Indeed, we recently found greater activation, particularly in left prefrontal areas in association with both increased age and decreased inhibitory ability (Nielson, Langenecker, & Garavan, in press, *Psychology and Aging*). The present study is part of a replication and extension of our previous work. Using a conditional Go/No-go task during fMRI (1.5T GE Signa), we compared 11 older and 11 younger adults. An inhibitory cluster map was derived using deconvolution and regression to produce a % area under the curve map for each group, which we compared using t-tests. Inhibition-based activation occurred in bilateral frontal and right parietal areas, replicating our previous findings. Unexpectedly, there were no group differences in task performance. Notably, older adults performed comparably in this study as in our previous studies, while younger adults performed significantly worse in the present study. Importantly, younger adults also had greater inhibition-based activation in the frontal lobes. Thus, frontal activation may be representative of functional compensation of neuronal systems in those who find the task difficult, as has been suggested by some working memory studies. Furthermore, although this study does not clarify age-related functional compensation, these results do underline the importance of behavioral data in interpreting activation differences.

D33 TRANSIENT ATTENTION DYSFUNCTION PREDICTS THE OCCURRENCE OF ERRORS

Mayra Padilla, Laura Hale, Robert Knight; University of California, Berkeley – The production and detection of errors has been a focus of considerable interest. This is in part, due to the discovery of the Error Related Negativity (ERN) which is an ERP generated during production of an incorrect response with a putative source in the anterior cingulate. Differing theories including error detection, conflict monitoring, and evaluation of the action plan have been proposed as the behavioral underpinning of this response-locked ERN. In an effort to clarify this issue, we examined the ERN and attention dependent ERPs in a flanker letter discrimination task. We found electrophysiological evidence of an attention deficit 500 msec prior to the ERN. These results suggest that errors are a result of transient deficits in attention as has been observed after prefrontal cortex damage in humans. In contrast to this decreased amplitude of attention dependent ERPs in posterior electrode sites for error trials, post-error trials showed an increased negativity in right lateral frontal sites. This amplitude increase for post-error trials suggests that the ERN signal may help reallocate attention to the task following an error, perhaps diminishing the probability of a future error. Thus, this pattern of results indicates that the ERN represents an online evaluation