FreeSurfer vs. Manual Tracing: Distinguishing Stable from Cognitively Declining Elders Using Prospectively Measured Hippocampal Volume

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Clinical standpoint. Further implications will be discussed.

Symptoms across both psychiatric and neurocognitive domains simultaneously. Such independence of variance is important to note from a clinical standpoint. This suggests that within clinical practice, individuals may over-state psychiatric symptoms on the MMPI or MMPI-2RF as measured by F-scale outcomes. This was measured by the RBANS Effort Index (EI) was calculated based on the methodology proposed by Silverberg and colleagues (2007). Correlations between outcome variables were run.

Results: No significant relationship between elevations on the RBANS EI and outcomes on the F-scale calculations of the MMPI-2 or MMPI-RF. Correlations with RBANS EI as follows: MMPI-2 F (r=.152; p=.065); MMPI-RF Fr (r=.171; p=.068), MMPI-RF NUC (r=.096; p=.363); MMPI-RF COG (r=.236; p=.064).

Conclusions: Results suggest that there is not an inherent link between effort on the RBANS as measured by the EI and exaggerated responding on the MMPI or MMPI-2RF as measured by F-scale outcomes. This suggests that within clinical practice, individuals may over state psychiatric concerns or neurocognitive concerns, but they may not endorse symptoms across both psychiatric and neurocognitive domains simultaneously.

Case-Control Study of Early Amnesic Syndrome (AES) and Language-Dominant Alzheimer’s Disease (AD) using the HCP-12H: Assessing Relative Distribution of Pathology.

Objective: To compare AES to AD using the HCP-12H in order to assess distribution of pathology in AES and AD. The HCP-12H is a compact artefact of neocortical plaques and neurofibrillary tangles.

Methods: Eight patients with AES and nine with AD were evaluated. Brain stereo-photographs of the HCP-12H were taken from both hemispheres of the left and right inferior parietal lobes. The number of plaques was counted.

Findings: The number of plaques was significantly higher in AES than in AD (p<0.05).

Conclusion: The HCP-12H provides a useful tool for assessing the distribution of pathology in AES and AD, and may help to identify differences in disease progression and pathology distribution.

Objective: To investigate the relationship between the amount of time needed to administer tests and the frequency of poor effort in patients with amnestic symptoms.

Methods: A longitudinal study of 100 patients was conducted. The amount of time needed to administer the tests was recorded, and the frequency of poor effort was assessed using the RBANS Effort Index (EI).

Findings: The amount of time needed to administer the tests was inversely correlated with the frequency of poor effort.

Conclusion: The amount of time needed to administer tests decreases the frequency of poor effort.
cognitive decline and conversion from MCI to AD. Measurement of hippocampal volumes has used either automated methods such as FreeSurfer (FS) or manual tracing (MT). We compared the ability of FS and MT in detecting baseline volume differences in cognitively intact older individuals who subsequently showed significant cognitive decline.

Participants and Methods: Seventy-five cognitively intact elders underwent baseline and 18-month follow-up structural MRI scan and neuropsychological testing. Participants were classified as Declining (n=27) or Stable (n=48) based on the baseline to 18-month changes on a list-learning task and a measure of general cognitive functioning. A 2 (left, right) x 2 (anterior, posterior) x 2 (Declining, Stable) repeated measures ANOVA was conducted for both the MT and FS hippocampal volumes derived at baseline.

Results: MT identified significantly smaller left and right hippocampal volumes and smaller anterior than posterior hippocampal volumes in Declining compared to Stable subjects. In contrast, no group differences in hippocampal volumes were observed using FS. Notably, MT included more subiculum and entorhinal cortex, while FS included more of the amygdala and the CA region of the hippocampus.

Conclusions: MT was superior to FS for detecting prospective volumetric differences associated with cognitive decline in cognitively intact older participants. MT afforded more unique coverage of the anterior hippocampus than FS. The differences in regional coverage of the mesial temporal lobe between MT and FS may account for the different findings in discriminating Stable and Declining groups.

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Objective: Many Afghanistan and Iraq war veterans continue to struggle years after withstanding a mild traumatic brain injury (mTBI). The range of severity from being dazed to experiencing formal losses of consciousness (LOC) may partly account for variable long-term cognitive and functional outcomes post-mTBI. As reduced white matter integrity and impaired executive functioning (EF) are associated with TBI, we used diffusion tensor imaging (DTI) to investigate whether injury severity (LOC) was related to executive dysfunction and white matter integrity.

Participants and Methods: Thirty-six combat military veterans with mTBI completed neurocognitive assessment and were scanned using DTI. EF impairments were defined as 1 SD below the mean on one or more of three EF tests. Fractional anisotropy (FA) was extracted from known TBI predilection sites identified on diffusion images.

Results: After removing 10 participants due to suboptimal effort, 11 of 26 participants evidenced executive dysfunction. Of participants reporting LOC (n=14), 57% were impaired on EF compared with just 25% of the non-LOC group (n=12, p<.01). DTI analysis found lower FA within the ventral (p<.01) and dorsal (p<.04) prefrontal white matter, and splenium (p<.05) in the LOC group. Groups did not differ on demographic characteristics or psychiatric measures.

Conclusions: Within our sample of combat veterans, LOC was associated with poorer white matter integrity in frontal and posterior regions, and the LOC group demonstrated a higher proportion of EF impairment than the non-LOC group. Findings highlight the heterogeneity of cognitive outcomes following mTBI and suggest that identifying the severity level within mTBI may aid prognosis and guide treatment.

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Objective: We aimed to investigate which anatomical locations are important for perception of emotional and social information by examining a group of brain surgery patients with discrete lesions to the prefrontal cortex (PFC). It was hypothesised that patients with PFC lesions would be more impaired on these tasks than a control group of non-cerebral neurosurgical patients.

Participants and Methods: Brain surgery patients were divided into groups using Brodmann areas, as determined by post-surgical MRI registered to MNI space. Patients had lesions to the anterior cingulate (n=4), orbitofrontal (n=7), ventromedial (VM, n=5) or dorsolateral (n=12) PFC. The control group comprised 26 extra-cerebral neurological patients. Participants completed a forced-choice computerised facial morphing task, a questionnaire that assessed theory of mind and empathy, and measures of the perception of emotion in still facial expressions, vocal expressions, and music from film clips.

Results: VM lesioned patients were impaired at identifying morphed facial expressions overall, and fear expressions in particular, and were additionally impaired on the theory of mind scale. They also rated the still facial expressions, vocal expressions, and music clips as more intensely emotional compared to the control group for both congruent (e.g. positive ratings of positive items), and incongruent (e.g. negative ratings of positive items) ratings.

Conclusions: Patients with VM lesions have both an impaired perception of the emotional value of stimuli, and a tendency to be disinhibited in responses when the task allows. The VM cortex is responsible for emotional evaluation and the inhibitory control of other structures involved in emotional processing.

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Objective: Previous research suggests that children with traumatic brain injury (TBI) demonstrate deficits in social information processing. This study aims to evaluate whether performance on a laboratory measure of social information processing predicts ratings of perceived social competence.

Participants and Methods: Participants included 8 to 12 year old children, 23 with severe TBI, 56 with complicated mild-to-moderate TBI, and 61 with orthopedic injuries (OI). For each of five scenarios involving a negative event with an unclear cause, children selected from a fixed set of choices the attribution for the cause of the event, their emotional reaction to the event, and how they would behave in response. Children completed the five scenarios twice, with the antagonist being an unfamiliar peer in one instance and the child’s best friend in the other. Social competence was assessed using parent ratings on the Social scale of the Adaptive Behavior Assessment System.

Results: Overall, children with severe TBI were less likely than children with OI to make attributions of external blame, choose anger as their emotional reaction, and respond by avoiding the antagonist; they were more likely to respond by requesting adult intervention. Among children with severe TBI, feelings of anger in situations with friends were negatively related to ratings of social competence on the ABAS. Among children with complicated mild-to-moderate TBI, avoidant responses towards unfamiliar peers were negatively related to social competence and requests for adult intervention in situations with friends were positively related to social competence.

Conclusions: The results provide evidence for effects of TBI on social information processing that may help account for social difficulties as perceived by parents.

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