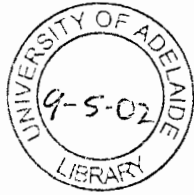


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**Title: The Role of the Basal Ganglia in Cognition and
Language**

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ABSTRACT

Discrete circuitry connecting the basal ganglia and cortical areas of the brain have received increasing attention as possible mediators of neuropsychological functions. Lesions of this circuitry among 25 right-handed people with various brain injuries (closed head injuries, cerebrovascular accidents and tumors) were verified by expert scrutiny of neuro-imaging. Their performance on measures of attention, performance of complex motor programs, executive functions, memory and language skills was compared to a control group of 11 subjects with spinal injuries and 13 right-handed people with early-stage Parkinson's Disease (PD). Data were analyzed according to an adaptation of classification tree analysis. Functions associated with this circuitry among the 25 brain injured subjects were dynamic allocation of attention between competing inputs (anterior cingulate circuit), problem solving that required consideration of several novel items of information in decision making and verbal elaboration of abstract phenomena (dorsolateral prefrontal circuit). Neither problem solving alone or working memory alone were associated with this circuitry. Significant differences between the lesion-subjects' and the PD subjects' performance were found. Mental processing associated with the basal cortical circuitry was orchestration of subprocesses (at the cortical level) and their integration, (at the subcortical level) to enable their fluid and effective synchronization for the person to complete more complex tasks.