Beginning in 1979, my research program has focused on the basic problem of the manner in which stroke and dementia impact patients’ access to both perceptual and stored representations of information. This work has focused on patients with aphasia, dementia and hemispatial neglect, examining basic cognitive processes involved in the integration of phonological and syntactic linguistic relationships and attention. This work led to a major theoretical paper published in the Journal of the International Neuropsychological Society discussing an important model of semantic memory called the Gain/Decay Hypothesis that has prompted much work in laboratories around the world. The Gain/Decay Hypothesis proposes that simple alterations in the time constant of neural network activation can have significant consequences for cognition. It proposes that an increase in the time constant of activation can be used to account for a wide variety of semantic memory phenomena in patients with Alzheimer’s Disease. This model has implications for a number of other disorders. See for example a study in the Journal of Clinical and Experimental Neuropsychology by Arnott, Chenery, Murdoch and Silburn who applied the model to a study of Parkinson’s Disease. In the last five years these interests have evolved to focus on the risk factors that contribute to the development of late life cognitive disorders, and studies of methods to treat the attentional disorders of hemispatial neglect. Reflecting this new direction of translational research, my funding includes a five year NIA grant (Claude Pepper Older American Independence Center (OAIC) at Harvard) to study the relationship between cerebrovascular risk and cognitive function in black elders, and a VA Merit Review to study the relationship of cerebrovascular risk on cognition in adults who are at risk for developing Alzheimer’s Disease.

Recent Publications


Figure 4. Regions showing associations between mean arterial blood pressure (MABP) and fractional anisotropy, and their spatial proximity to regions showing white matter signal abnormalities.