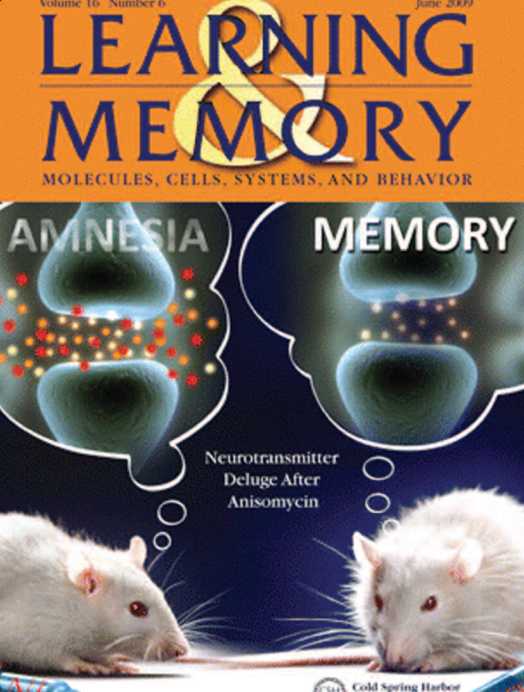


Cognitive and Brain Health



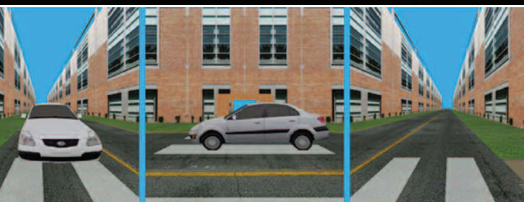
Beckman Institute
FOR ADVANCED SCIENCE AND TECHNOLOGY



Cognitive and Brain Health

The factors involved in cognition and brain health are many. Beckman Institute researchers have demonstrated the links between cognitive and brain health and lifestyle choices such as exercise and social and intellectual engagement, through the use of a variety of imaging techniques, and shown the ability of the brain to generate new neurons and connections. Several have focused on cognition and health in older adults, a rapidly-growing segment of the population, while others study topics such as the many modern distractions that test the limits of our cognitive abilities.

Researchers at the Beckman Institute are investigating important topics involving development and aging, using experimental studies and advanced bioimaging techniques, to show the beneficial effects of aerobic fitness on cognition across the lifespan. Another important lifestyle topic for people of all ages is the effect ubiquitous devices like cell phones may have on cognition and subsequently, other aspects of our lives, including driving.



Art Kramer has been a leader in studying the mediating effects exercise can have on brain structure and function and, consequently, cognition in older adults. Among his many groundbreaking projects was the first study to show a link between exercise and beneficial changes in the brain in older adults, as well as pioneering driver distraction studies.



developed computational models of speech production to study language in both normal adults and those with neurological disorders.

Charles Hillman has brought scientific data to the problem of childhood obesity and the effects of exercise, or lack of exercise, on cognition and the brain in adolescents.

Hillman's research has shown the beneficial effects of exercise on the adolescent brain and cognitive benefits such as improved school performance.

Kara Federmeier studies hemispheric differences in older adults and age-related changes in cognition, in order to understand how the aging process affects language functions like the processing of semantic meaning.

Elizabeth Stine-Morrow created the Senior Odyssey of the Mind program in part to test the hypothesis that engaging in intellectual challenges, such as the creative problem solving that is part of Senior Odyssey of the Mind, could contribute to cognitive vitality, and as an intervention program for older adults.

Dan Morrow developed an easy-to-use memory aid that enables older adults to adhere to their medication regimen. Called a medtable, the medication schedule table addresses the challenges older adults face after leaving the doctor's office, when they are asked to fit an effective drug-taking regimen into their daily schedule.

Gary Dell led a project studying the linguistic aspects of a global positioning system that is designed to provide directions to older adults in automobiles, and another showing that driving impairs our ability to produce and comprehend language. He has also

Dan Simons studied how people compensate for distraction under naturalistic driving conditions and found that people often don't realize the effect that distractions such as talking on a cell phone have on their driving performance.

Justin Rhodes investigates the neural mechanisms underlying behaviors such as addiction and has found that the earlier in life that an individual starts taking drugs plays a role in their future chances at becoming addicted.

Edward McAuley is a leader in studying the important effect that self-efficacy, the belief that one has a mastery over their physical abilities, plays in achieving exercise goals. He also collaborates with **Art Kramer** on studies of exercise effects on cognition and the brain.

Florin Dolcos investigates the neural mechanisms underlying emotion-cognition interactions, both to provide insight into the topic and to shine a light on disorders like PTSD and sleep deprivation.