

# School of Behavioral and Brain Sciences

## Strategic Plan

### I. Mission Statement

The mission of the School of Behavioral and Brain Sciences at the University of Texas at Dallas is to understand the intersection of mind, brain and behavior, to enhance the health, education, and quality of life of children and families; and to create and implement technology that repairs and strengthens human abilities. We accomplish these goals by recruiting and supporting outstanding faculty to do innovative research and offer student training in a climate that fosters collaboration across disciplines. The School of Behavioral and Brain Sciences offers excellent educational programs at all levels, including carefully designed courses and ample opportunities for mentoring in research laboratories and in internship settings. We seek a high level of engagement with the Dallas, Richardson, and Plano communities by offering a broad array of clinical services, public lecture series, and faculty members as consultants and speakers for community groups.

### II. Current Status

The School of Behavioral and Brain Sciences offers an integrated array of academic programs, research, and clinical and educational services in two locations. The School's primary base on the main U.T. Dallas campus supports its growing undergraduate programs and doctoral programs in Psychological Sciences and Cognition and Neuroscience. The Callier Center for Communication Disorders on the campus of the U.T. Southwestern Medical School has an international reputation for research, training, and service in hearing, speech, language, and preschool education provides, supports doctoral programs in Communication Sciences and Disorders and Audiology and has provided an enduring connection to the medical and educational communities. The Center for Brain*Health* will be opening an additional facility adjacent to UT Southwestern Medical School in 2006.

Since its inception, the School of Behavioral and Brain Sciences has encouraged faculty and students with different backgrounds and perspectives to share their knowledge and to solve problems requiring an interdisciplinary approach. Grounded in laboratory science, the School has extensive research and training programs with clinical applications. The School's degrees, programs of research, and students are infused with a model of disciplines working together and scientist-practitioner collaboration. The School now has in place programs of excellence in Psychology, Communication Sciences and Disorders, Neuroscience, and Cognitive Science complemented by internationally-recognized research centers for Brain*Health*; Advanced Hearing Research; and Brain, Behavior and Cognition. The School of Behavioral and Brain Sciences has already established productive, successful collaborations with U.T. Southwestern Medical School. Each of the School's interdisciplinary research centers is closely aligned with U.T. Southwestern. Graduate students now have access to patient populations and to advanced brain-imaging technology. A new joint Ph.D. program in Clinical Psychology will result in further exchanges of faculty, students, and research ideas. The triad of the School of Behavioral and Brain Sciences, U.T. Southwestern, and the community provides a powerful force to support the future of the University.

### III. Strategies for Success

#### **A. Enhancing the health, education, and quality of life of children and families.**

##### *Create a Center for Child and Family Development*

The mission of the Center for Child and Family Development will be to promote optimal development across the lifespan by enhancing research, practice, and outreach in the following areas: early childhood intervention, social and communication skills, excellence in education, research supported clinical practices, and optimal aging. This innovative center will support research in child development and peer, family, and care-provider relationships; provide leadership in collaborative research and clinical services to persons with speech, language, and hearing impairments and their families; and offer expertise in program evaluation, conduct clinical trials, assess treatment efficacy, and develop evidence-based practice. The Center for Child and Family Development will also serve as a community outreach center for public education, consultation, and training of community professionals; assistance to community agencies; and as a national resource for generation and dissemination of knowledge and practice through national conferences and topical workshops on child and family development.

The Center for Child and Family Development will be housed on the main campus in Richardson, and will join the Callier Center for Communication Disorders (on the campus of the U.T. Southwestern Medical Center) as a community oriented research and clinical center. The Center for Child and Family Development will be innovative in that it will house diverse but integrated research, clinical, and outreach activities all in the service of improving the lives of children and families.

#### **B. Understanding the mind and brain.**

##### *Become an internationally recognized center for research in cognitive neuroscience and in the diagnosis and treatment of cognitive disorders.*

The School of Behavioral and Brain Sciences will become a major force in research and clinical applications of brain imaging technology, by the imminent expansion of the Center for BrainHealth and the adjacent Metroplex Advanced Imaging Center. The Center for BrainHealth specializes in clinical research on the assessment, treatment, and prevention of brain disorders, including traumatic brain injury, dementia, and stroke. The Center is augmented by substantial expertise from faculty housed at the Callier Center for Communication Disorders. The Center for BrainHealth and the Callier Center together provide clinical laboratories and opportunities for groundbreaking discoveries in cognitive neuroscience, including expansion to focus on autism, attention deficit-hyperactivity disorder, schizophrenia, and other disorders of mind and brain. Together, the Center for Brain Health and the Metroplex Advanced Imaging Center will provide an unparalleled opportunity for the design and application of research-based treatments to maximize plasticity and the recovery potential of the brain.

To prepare students seeking research careers in functional brain imaging and in etiology and treatment of cognitive, affective, and social deficits arising from brain damage and neurodegenerative disease, we will establish a doctoral degree and post-doctoral training in

Cognitive Neuroscience. This new program has the potential to achieve world class stature, with the addition of several key faculty appointments in combination with the Metroplex Advanced Imaging Center, faculty from Behavioral and Brain Sciences and U.T. Southwestern Medical School, the resources of the Callier Center, and the Center for BrainHealth. Given the facilities and personnel available through a collaborative program, we will develop a key site for post-doctoral training of researchers who plan to use functional brain imaging as a tool in research and medicine.

Last, we will build on our expertise in Cognition and Speech Science to develop a center for collaborative efforts with local high tech industries in domains such as face recognition, natural language processing, computer processing of text and human machine interaction. These initiatives would combine with expertise in Electrical Engineering and Computer Science and Arts and Technology to bring human science to technology and thereby expand its applications.

### **C. Create and implement technology that repairs and strengthens human abilities.**

*Establish a Neurotechnology initiative within the School of Behavioral and Brain Sciences and in collaboration with the U.T. Dallas School of Engineering and Computer Science, U.T. Southwestern Medical School and area high-tech industry.*

Never have there been greater opportunities for discovery and progress in the treatment of neurological diseases. Remarkable advances in our understanding of the biological bases of disease suggest potential therapeutic possibilities and require that basic, applied, and clinical scientists combine and coordinate their efforts. This translational process will require the application of emerging technologies such as magnetic and electrical brain stimulation, nanoscale materials and devices, computer-based retraining of cognitive and perceptual deficits and development of sophisticated wireless devices to ameliorate cognitive, perceptual, and motor deficits.

The Behavioral and Brain Sciences Neurotechnology initiative will catalyze the development of partnerships between basic and clinical investigators and stimulate agreements between the academic and industrial sectors. Translational research in neuroscience will flourish as a cooperative, iterative process leading to new and effective interventions for neurological disorders. Specific areas of discovery and collaboration include: neural prostheses (reversible deactivation of brain circuits, patterned electrical stimulation of motor/sensory neurons in paralysis, deep brain stimulation, cochlear implants); brain plasticity (cross-modal re-mapping, plasticity after cochlear implantation, biofeedback training after stroke); and neuropharmacology of human disease (neurotransmitter modulation of sensory cortex, pharmacological stimulation of learning and brain plasticity, pharmacotherapy for dementia.)

## **IV. Summary Statement**

The opportunities for new initiatives within the School are critically linked to facilities development and renovation and to a substantial increase in faculty. To resolve the problem of faculty dispersion across 4 campus buildings, we propose to build a facility adjacent to Callier-Richardson to house all main campus faculty and allow adequate room for growth. Substantial renovation of the nearly 40 year-old Callier-Dallas facility is also necessary to accommodate

proposed new community outreach activities and collaborative programs with U.T. Southwestern. A near doubling of faculty to approximately 60, including both senior leadership and junior faculty, will be required for program expansion and to fully implement proposed new research programs and community-oriented activities. These essential additions of faculty and space will allow the School to achieve its vision for excellence and become a key contributor to the University's attainment of world-class stature.