BROWN

Boldly Brown: Campaign for Academic Enrichment

The Mind Brain Behavior Center:

Home for Ground-Breaking Research and Teaching

A Case for Support

BROWN UNIVERSITY MIND BRAIN BEHAVIOR BUILDING - RENOVATION
LEERS WEINZAPFEL ASSOCIATES F+D PRESENTATION 20 MAY 2009

PROPOSED WALKWAY AND ENTRIES

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The Mind Brain Behavior Center:
Home for Ground-Breaking Research and Teaching

Picture the chase scene in *Return of the Jedi* when Leia and Luke careen through the woods on speeder bikes. Ever wonder just how skilled we humans might become in collision avoidance behavior? Scientists in Brown's VENLab—one of the largest virtual reality labs in the country—are doing just that. Using avatars set in a virtual Grand Central Station at rush hour, Brown researchers are studying the patterns of locomotion that people employ to avoid bumping into one another in crowded places. Their research is intended to confirm that rather than using centrally controlled solutions, the brain modulates information to tweak a desired outcome much like the surfer modifies behavior to stay atop a wave. In time, architects, engineers, and city planners might use this kind of research to design better highway ramps and emergency exits from buildings.

Much is underway in Brown's Cognitive, Linguistic and Psychological Sciences department (soon to be named CLiPS) under the direction of department chair William Warren, Ph.D. Ground-breaking research is being conducted across the board. Exciting new visual perception experiments utilizing virtual reality techniques have led to partnerships with IBM and Draper Labs that foretell growth and momentum for this emerging program of study at Brown. The departments of Psychology, Linguistics, and Cognitive Science have merged, with plans to hire new faculty and totally reconfigure the 1920s-era brick facility called Metcalf Labs, creating a new Mind Brain Behavior Research Center. The $42-million renovation will gut Metcalf, leaving only a structural shell, and will transform the interior to provide the newly-merged departments of Psychology, Cognitive Science, and Linguistics with new classrooms, laboratories, and meeting spaces to facilitate the collaborative work ahead.

Virtual Reality—One of the Largest Facilities in the Country

CLiPS research uses virtual reality techniques to investigate the nature of the brain's control of human action. Dr. Warren's research in the VENLab (Virtual Environment Navigation Lab) has focused on locomotion, including bouncing, steering, braking, obstacle avoidance, and interception. For example, early research showed that babies quickly learn to use their legs to bounce in the most effective manner in order to reach the highest amplitude, or what Warren refers to as "peak bouncing." From that data, Brown researchers employed virtual reality technology to study the ways that athletes modify behavior to catch a fly ball or intercept a pass. Over the summer, one of Brown's honors undergraduates utilized an UTRA (Undergraduate Teaching and Research Award) and virtual models to predict avoidance behavior and draw conclusions about "why the rabbit evades the fox in a zig-zag pattern." Warren's work is exploring the dynamic cycle that exists between the brain and its environment.

Brown is also making impressive progress tackling questions that arise at the collision point between intention and behavior. With the merger of the cognitive & linguistic sciences departments with psychological sciences, Brown is now home to a new, cross-disciplinary group of scientists designing cutting edge research where the mind, brain, language, and behavior interact.

A State-of-the-Art Facility Enhanced by Collaborative Spaces

As a recent editorial in *Science* magazine declared, "Without the cooperation of researchers in several fields, many of today's important discoveries would never have been possible." Thus, the newly-configured Mind

Brain Behavior Center will be characterized by classroom and research spaces that enable and reinforce the collaborative nature of research. 73,000 square feet of refurbished space will provide classrooms, offices, meeting spaces, and state-of-the-art laboratories for our research teams in Cognitive, Linguistic and Psychological Sciences and will advance our ability to attract elite scholars and clinicians, post-doctoral fellows, graduate students, and promising undergraduate neuroscience concentrators.

Your leadership gift to help renovate Metcalf and transform it into a new Mind Brain Behavior Center will associate your name with the pioneering work of some of the country's most talented scientists.

The University is committed to increasing the number of faculty participating in mind-brain-behavior teaching and research, and to providing superior facilities to attract and retain top scientists. As our faculty expands, so too will the number of classes and research projects, creating a critical need for large lecture halls, small, seminar-style classroom spaces, and new laboratories. The renovations to Metcalf will help facilitate that growth.

Preliminary designs call for the integrated use of all four floors of the complex, creating:

- 36,000 square feet of lab space
- 14,000 square feet of classroom space
- 23,000 square feet of administrative and office space

A completely refurbished exterior courtyard in the center of the complex will become an impressive amenity for the building, the campus, and most importantly for the program.

We have selected Leer Weinzapfel as the architectural firm to design the renovation. Leer Weinzapfel received the American Institute of Architect's 2007 "Firm Award," the Institute's highest honor, in recognition of their history of design excellence. Throughout its 25-year history, the firm has produced notable design work for universities across the country: Harvard University's Science Center Expansion and

its Library Services Building, MIT's Media Lab, University of Cincinnati's University Pavilion, University of Pennsylvania's Gateway Complex, and the University of North Carolina's Global Education Center, to name only a few. This award-winning firm is known for its commitment to "ingenuity, resourcefulness, and design excellence."

Attracting and Retaining Top Scientists

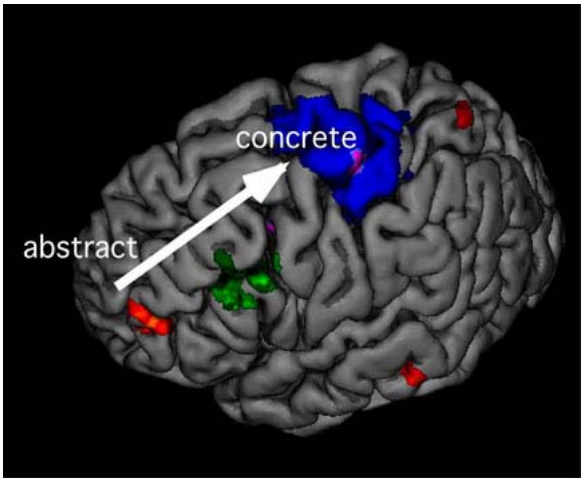
In the coming years, the Department of Cognitive, Linguistic & Psychological Sciences will hire seven new faculty members. Already, the program has been able to recruit outstanding scientists like **Bertram Malle,** Ph.D., Professor of Psychology and **David Badre**, Ph.D., Assistant Professor of Cognitive Science. Together with top-notch researchers like **Rebecca Burwell**, Ph.D., Professor of Psychology and Neuroscience and **William Warren**, Ph.D., Professor and Chair, Cognitive and Linguistic Sciences, Brown is building a stellar research and teaching program poised to take a leadership role in the twenty-first century.

The Science of Intention

Professor **Bertram Malle** studies the capabilities of the "social mind." His research looks at other people's intentions and makes reliable inferences about those intentions and states of mind. "I would call it 'social judgment,'" he says. "The ability to deal with the complexity of human behavior—to make sense of others' behavior—is one of the great achievements of the human mind. You can see someone start to cross the street and you quickly figure out what they are up to, what their intentions are." After earning his two Master's degrees at Graz, Malle continued his studies at Stanford, where he received his Ph.D. in 1995. Recruited to the University in 2008, Malle was attracted by Brown's commitment to growth. "The realization of how serious the departments of psychology and cognitive and linguistic sciences were about their unification — the prospect of what this joint department could be —was all very exciting," he says. The opportunity to join a growing department and to shape his core area of social psychology with cognitive science, linguistics, and other disciplines appealed to Malle. "Brown suddenly seemed like my home," he says.

Frontal Lobe Decision Making—Like Making a Sandwich

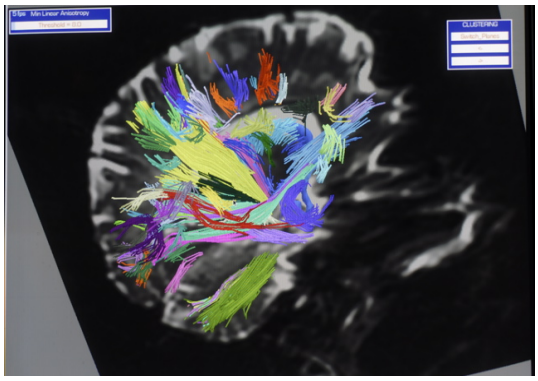
A recent study of stroke victims led by **David Badre** has produced evidence that the frontal lobe of the human brain controls decision-making along a continuum from abstract to concrete, from front to back. To illustrate this concept, Dr. Badre uses the metaphor of sandwich making. The decision to make a sandwich is abstract. The decisions made with regard to the sequence of sandwich making i.e., getting out the bread, spreading the mayonnaise, adding lettuce, etc. are concrete. Scientific data now supports theories that abstract decisions about action, such as "*I'm hungry and will make a sandwich,*" take place in the front of the frontal lobe. The back portion controls the capacity for concrete decisions, such as "*First, I'll get the bread out.*" It is the progression from front to back that represents a huge leap in comprehending just how the brain



supports higher level cognition and intelligent behavior. It could lead to advances in everything from the treatment of strokes, to understanding how humans develop thought.

Heading in New Directions

Rebecca Burwell, Professor of Psychology is studying the brain systems that support human memory. The goal of her research is to understand how neurons encode, store, and retrieve memories. The regions that are important for memory are similar in structure and function across the rodent, monkey and human brains; these cross-species similarities make it possible to combine sophisticated behavioral and neurobiological approaches in rodent models to explore questions about how human memory works. Dr. Burwell's research has implications for understanding normal memory, as well as memory problems caused by aging, brain trauma, degenerative diseases, and developmental disorders.



Much of the department's work has broad implications for the medical field. For example, research conducted in neurolinguistics by Professor **Sheila Blumstein** studies eye movement in stroke victims and may one day lead to rehabilitative strategies for people suffering from aphasia, Parkinson's, and Alzheimer's disease. Concurrently, research on the visual control of locomotion and navigation, conducted in the VENLab, is investigating how vision controls movement, with recent research illustrating the enormous potential of virtual reality to help rehabilitate patients with lower limb injuries.

Sending Researchers out into the World

Graduates of Brown's CLiPS program often go on to graduate school and become leading researchers and scientists in their own right. An example of this is social psychologist and MacArthur Fellowship "Genius Grant" recipient, **Jennifer Richeson,** Brown '94. Richeson has been attracting quite a bit of attention with her research at Northwestern University into the continuing role played by prejudice and stereotyping and their effect on how people communicate with each other. Groundbreaking research to date points to the idea that the efforts people make to avoid seeming prejudiced make interracial communication more cognitively taxing. Richeson's research explores motivational and contextual variables that influence how racial cues are used in categorizing other people. Bringing new life to the topic of intergroup relations, she takes the lead in highlighting and analyzing major challenges facing all races in America and the continuing role played by prejudice and stereotyping in our lives.

Whether in pursuit of fundamental knowledge or medical breakthroughs, scholars at Brown collaborate across disciplines to pursue a range of related research questions: How are humans' goals connected to their decision-making processes? Is there such a thing as a warrior gene? Can electricity repair the central nervous system? Step by step, we are making major progress in tackling these and other crucial questions, precisely because our scientists communicate across fields. When it comes to interdisciplinary research, no one does it better than Brown.

Naming Opportunities*

Hundreds of students and faculty will daily cross the threshold of this newly renovated building to attend classes, pursue research in the laboratories, and confer in the offices and conference rooms. There are naming opportunities throughout the building, many of them in high-visibility, high-traffic areas such as the 200-seat auditorium on the first floor or the lounge-conference areas on each of the four floors. Premier naming opportunities include:

[Donor's Name] Mind-Brain-Behavior Center **$20 million**
Your gift of $20 million will name the center, associating your name with the extraordinary research and teaching conducted within this building.

[Donor's Name] Wing **$10 million**
The Metcalf Complex consists of two wings perpendicular to each other. The four-story north-south wing, which faces Thayer Street and is framed by the iconic Soldiers Arch, will have significant traffic and high visibility, with the first floor housing various sized classroom spaces, and the second through fourth floors housing busy research laboratories. This wing will also contain the second-floor library and large faculty conference room on the third floor.

[Donor's Name] Wing **$ 8 million**
The east-west wing of the Metcalf complex, which faces Lincoln Field, will have three floors of faculty and administrative offices. High-traffic public lounge/conference areas will be at the east end of each corridor.

[Donor's Name] Courtyard **$ 4 million**
This attractive public area nestled in the area created by the intersection of Arnold Lab with the two wings of the Metcalf Complex will be a popular gathering spot and high traffic area.

[Donor's Name] Auditorium Classroom **$ 3 million**
This 250-seat auditorium will be in regular use for classes throughout the day.

[Donor's Name] VEN LAB **$2.5 million**
Your gift will associate your name with the cutting-edge research conducted in this virtual reality laboratory.

Faculty Conference Room (3rd floor under the restored dome) **$1 million**

Other Naming Opportunities include:

First Floor Classrooms (270-939 square feet)	**several @ $325,000 - $1 million**
Lounges/conference areas (public areas on each floor)	**four @ $ 750,000 each**
Laboratories (300 - 570 square feet)	**several @ $200,000-350,000**
Administrative and faculty offices (134-450 sq feet)	**many @ $100,000-$300,000 each**

*Naming opportunities start at approximately $600 per square foot, and increase depending on the public visibility, volume of traffic, prominence of space, significance of use, and so on.

Conclusion

The master plan for Brown's strategic growth calls for an ambitious building program to ensure that our facilities are as impressive as our faculty and students. Your leadership gift of $100,000 or more will play a key role in completing the mosaic of Brown's 21st century campus. Won't you join with us and support Brown's ground-breaking research into the Mind, Brain, and Behavior?