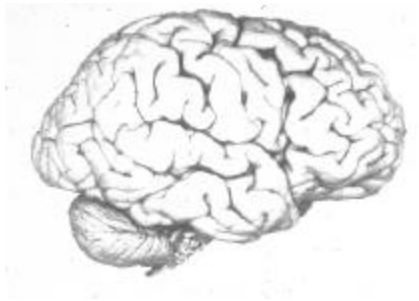
The Graduate School and University Center - City University of New York

Neuropsychology

Ph.D. Program

5th Annual Neuropsychology Research Day



Keynote Speaker:
Dr. Jonathan D. Cohen
Princeton University

Behaviors to Neurons

Neurons to Behaviors

Neuropsychology & Emotion

Cognitive Neuroscience

Alzheimers & Parkinson's Disease

Epilepsy & Brain Imaging

Psychopharmacology

Affective Behavior

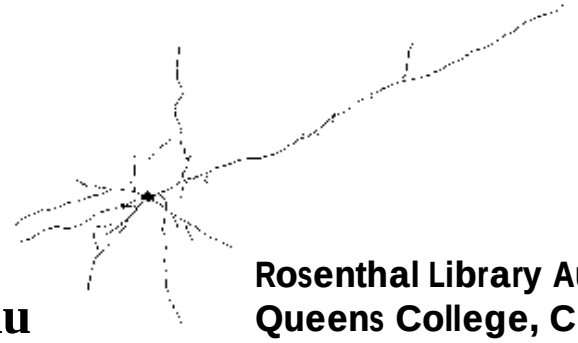
Sensory Processing

Learning & Memory

Neurophysiology

September 7, 2007

9:00AM-4:30PM



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Rosenthal Library Auditorium
Queens College, CUNY

Fifth Annual Neuropsychology Research Day
September 7, 2007

9:00-9:10 AM	Welcome Joshua Brumberg, Ph.D., Organizer and Founder Neuropsychology Research Day
Session I:	
Moderator:	Janine Flory, Ph.D. Director of Clinical Training Neuropsychology
9:10-9:25	Role of Dopamine in the Nucleus Accumbens and Amygdala in Mediating the Acquisition and Expression of Fructose-Conditioned Taste. Sonia Bernal (Bodnar Lab)
9:25-9:40	Outsourced memory: Do alarms reduce monitoring in a dual task? Anna Obraztsova (Golub Lab)
9:40-9:55	Neocortical processing in the mouse sensori-motor system Eric Chen (Brumberg Lab)
9:55-10:10	Hippocampal changes in the wake of a seizure, one way street, or traffic circle? Daniel McCloskey, Ph.D.
10:10-10:25	The relationship between attention, behavior, and caregiver stress in patients with Alzheimer disease undergoing cholinesterase inhibitor treatment. Lillian Kaplan (Foldi Lab)
10:25-10:45	Questions
10:45-11:00	Coffee Break
Session II:	
Moderator:	Richard Bodnar, Ph.D., Chair, Psychology Department
11:05-11:20	Functional analysis in clinical treatment Peter Sturmey, Ph.D.
11:20-11:35	The effects of VTA AMPA receptor blockade during cocaine seeking in rats Brian C. Nolan, Ph.D.
11:35-11:50	An Examination of Cognitive and Emotional Empathy in Asperger Syndrome Kimberley Rogers (Borod Lab)
11:50-12:00 PM	Questions
12:00-1:00 PM	Lunch
Session III: Keynote Speaker	
1:00-2:30	Words of Welcome:

Thomas C. Strekas, Ph.D.
Dean Division of Mathematics and Natural Sciences
Queens College, CUNY

Introduction of Keynote Speaker:
Joshua Brumberg, Ph.D.
Program Head, Neuropsychology Ph.D. Subprogram
Department of Psychology, Queens College, CUNY

Keynote Speaker:
Jonathan D. Cohen, M.D., Ph.D.
Eugene Higgins Professor of Psychology
Director, Center for the Study of Brain, Mind and Behavior
Director, Program in Neuroscience
Princeton University

Optimization of Decision Making and Cognitive Control: Formal Models, Behavior, and Neural Mechanisms

2:30-2:35 Break

Session IV:
Moderator: Joshua C. Brumberg, Ph.D. Program Head Neuropsychology

2:35-2:50 Behavioral Regulation of Neuronal Lifespan in the Adult Zebra Finch Model System
Sara Wildstein (Pytte Lab)

2:50-3:05 Finding Mr. Wrong: Divergences in Mate Preferences and Mate Selection
Claudia Brumbaugh, Ph.D.

3:05-3:20 Are saccades during memory search epiphenomenal? Saccadic suppression does not affect performance on non-visual cognitive tasks characterized by high eye movement rate.
Dragana Micic, Ph.D.

3:20-3:35 Noradrenergic Modulation of Attention
Suzanne Clerkin (Halperin Lab)

3:35-3:50 Vascular Depression: A distinct diagnostic entity
Joel Sneed, Ph.D.

3:50-4:05 Long-term effects of VEGF administered during status epilepticus
Janice Lenzer (Croll Lab)

4:05-4:20 pm Questions

Fifth Annual Neuropsychology Research Day
September 7, 2007

Session I

Role of Dopamine in the Nucleus Accumbens and Amygdala in Mediating the Acquisition and Expression of Fructose-Conditioned Taste Preferences in Rats

Sonia Bernal (Bodnar Lab)

Flavor-flavor preference learning occurs in rats in 2-bottle choice tests by pairing a neutral flavor (CS+) with the preferred flavor (US) of fructose, and demonstrating preference over another neutral flavor (CS-) paired with less-preferred saccharin. A critical role for dopamine D1 and D2 receptors in acquisition and expression of flavor-flavor preferences was demonstrated by elimination of preferences following systemic injections. Given the role of the roles of the nucleus accumbens shell (NacS) and amygdala (Amyg) in mediating dopaminergic mechanisms involved in food intake, the present study examined whether NacS or Amyg microinjections of D1 (SCH23390) and D2 (raclopride) antagonists altered the expression of already-learned flavor-flavor preferences (Experiments 1 and 2) and whether such pharmacological treatments during training altered acquisition of these fructose-conditioned flavor preferences (Experiment 3). Rats were implanted with bilateral cannulae in one site and food-restricted (85-90% body weight) after recovery in both experiments, In Experiments 1 and 2, rats received ten 1-bottle training sessions (30 min) alternately 16 ml of flavored (0.05% grape or cherry unsweetened Kool-Aid) 8% fructose and 0.2% saccharin solution (CS+/F), or a differently-flavored 0.2% saccharin solution (CS-/S). Two-bottle (50 ml) choice tests (30 min) in which both flavors were presented in 0.2% saccharin (CS+/S, CS-/S) with bottle positions counterbalanced across pairs of test days were conducted in which animals received vehicle or 12, 24 or 48 nmol bilateral injections into a given site of either SCH23390 or raclopride. SCH23390 produced dose-dependent reductions in CS+/S, but not CS-/S intake following microinjection into the NacS and Amyg with concomitant reductions in CS+/S preferences from 76% to 60%. Raclopride produced comparable, but more modest effects in both sites in reducing the expression of fructose-conditioned flavor preferences. In Experiment 3, rats received eight 1-bottle training sessions (1 h) alternately 16 ml of flavored (0.05% grape or cherry unsweetened Kool-Aid) 8% fructose and 0.2% saccharin solution (CS+/F), or a differently-flavored 0.2% saccharin solution (CS-/S). A rest day separated each pair of training days with food supplied 1 h after training and testing. The first two subgroups of NacS and Amyg rats received SCH23390 or raclopride (12nmol total, 6 nmol/side) 10 min prior to training. The third (Yoked Control) subgroups received vehicle, with CS+/F and CS-/S intakes limited to that of the drug subgroups. A fourth (Untreated Control) subgroup of unoperated rats received unimpeded training. CS+/F intake was always greater than CS-/S intake during training. In six 2-bottle (50 ml) choice tests (30 min), both flavors were presented in 0.2% saccharin (CS+/S, CS-/S) with bottle positions counterbalanced across pairs of test days. Untreated and Yoked Controls for both sites consumed significantly more CS+/S than CS-/S over the 3 pairs of test days with stable CS+/S preferences (64-66%). SCH23390 or raclopride in the NacS during training failed to affect acquisition of flavor preferences on the first (70-73%) and second (64-66%) pairs of test days, but both significantly hastened extinction by the third (56-60%) pair of test days. Although D1 or D2 antagonism in the Amyg during training failed to affect acquisition of flavor preferences on the first (70-71%) pair of test days, SCH23390, but not raclopride in the Amyg significantly hastened the extinction on the second (59%) and third (57%) pairs of test days. Thus, D1 and to a lesser extent D2 receptors in the NacS and Amyg participate in mediating the full expression of fructose-conditioned flavor preferences. Moreover, although blockade of D1 and D2 receptors in the NacS and Amyg fail to alter initial acquisition of fructose-conditioned flavor preferences, they hasten its extinction through mostly a D1-mediated effect.

Outsourced Memory: Do Alarms Reduce Monitoring in a Dual Task?

Anna Obraztsova (Golub Lab)

The goal of the current project was to elucidate the relationship between prospective memory and working memory. Prospective memory (PM)—remembering to do something in the future (e.g., taking a pill at lunch)—taps into limited working memory resources (Kliegel, Martin, McDaniel & Einstein, 2002). Adherence to an ongoing continuous PM task (e.g. a medication regimen) requires availability of sufficient cognitive resources (Marsh & Hicks, 1998), and may impose costs on other essential activities that rely on working memory, resulting in deteriorated performance (Smith, 2003, Smith & Bayen, 2004, 2005; Einstein, McDaniel, Thomas, Mayfield, Shank et al., 2005). It was hypothesized that a PM task (remembering to remove a small object from a container in a desk drawer) will decrease performance on an ongoing working memory task (n.back), and that the effect will depend on participants' expectation of the monitoring demands of the PM task. We hypothesized that the impact on their working memory performance will be reduced if there exists a reminder for the prospective memory task (e.g. an alarm clock). We hypothesized that the impact on their working memory performance will be greatest for participants without any reminders (time-based PM), and least for participants with an audio alert as a signal to perform the task (event-based PM). Additional group of participants received an alert to perform the task at the specified time (time-based PM with reminder), and was expected to perform similar to the Event-based PM group, since no time monitoring was actually required. Analyses revealed that groups differed in their ongoing task performance, especially before and after the PM task. These findings show the impact of different PM task conditions on the ongoing performance, as well as suggest different strategies for PM success.

Neocortical Processing in the Mouse Sensori-motor System
Eric Chen (Brumberg Lab)

The Brumberg lab is dedicated to the understanding of structure, function, and plasticity of the neocortex. This neural microcircuit system is at the heart of the information processing capability of mammals such as sensory, perception, memory, volitional movements, and other higher order neurocognitive functions. The neocortical microcircuit exhibits omnipotent computational capabilities which can simultaneously partake in an unrestricted number of tasks. This capacity allows the neocortex to be parcellated into multiple overlapping modular columns that form the very foundation of functional compartmentalization of the neocortex. In order to derive a blueprint of this highly complex microcircuit, we study the neurons in terms of their anatomical as well as physiological properties. By focusing on the sensori-motor cortices that are easily manipulated through the rodent mystacial vibrissae pads, our lab was able to gain additional understanding and appreciation of the complexity of this phylogenically advanced informational processing system. Understanding the anatomical and physiological neuronal characteristics within the neocortex is an important step towards understanding the constituents and their role in the processing of environmental information.

Hippocampal Changes in the Wake of a Seizure, One Way Street, or Traffic Circle?
Dan McCloskey, Ph.D.

Epilepsy is a neurological disorder that can affect many brain areas in many ways. The most common form of epilepsy causes cell loss and physiological changes in the mesial temporal lobe, an area that contains the hippocampus and other structures involved in learning, memory and emotion. Patients with temporal lobe epilepsy often have memory and mood disturbances, demonstrating the influence of this disorder on brain function. My research is engaged in understanding how the hippocampus and related structures are changed by the development of epilepsy. Using a common animal model of temporal lobe epilepsy, I have identified anatomical and physiological changes that coincide with both the development of seizures and disturbances of memory and mood. I will present these data along with future directions in studying similar pathophysiology in related neurological disorders.

The Relationship Between Attention, Behavior, and Caregiver Stress in Patients with Alzheimer Disease Undergoing Cholinesterase Inhibitor Treatment.
Lillian Kaplan (Foldi Lab)

Objective: Alzheimer's Disease (AD) involves depletion of the neurotransmitter acetylcholine, deterioration of attentional function, and increasingly maladaptive behaviors. Eventual loss of functional independence increases caregiver stress. Cholinesterase inhibitors, such as donepezil (Aricept), augment available acetylcholine and have been reported to improve behaviors. However, to date, research has not linked improved patient's functional behavior with improvement in attention. The present study examined the relationship between changes in attention, behavior and caregiver distress in AD patients being treated with donepezil. *Method*: In a longitudinal design, thirteen patients with AD initiating donepezil treatment were assessed on a) a simple detection task testing maintained attention, b) global measures of disease severity (The Alzheimer Disease Assessment Scale-Cognitive Section; Mini-Mental Status Examination) c) neuropsychiatric behavior and caregiver distress measures (Neuropsychiatric Inventory) before, during and after 6 months of treatment. *Results:* Patients were divided into responders and non-responders based on industry standard 6-month performance on ADAS-Cog. Those who responded a) slowed their reaction time to detecting stimuli and b) the slowed response times were positively correlated with improved ratings of neuropsychiatric behaviors and caregiver distress. *Discussion:* These preliminary findings suggest that in patients with AD who respond to treatment, changes in attention result in less impulsive, slower responses to stimuli, which in turn may underlie improvements in behaviors. These in turn may provide caregivers less distress.

Session II

Functional Analysis in Clinical Treatment
Peter Sturmey, Ph.D.

Applied behavior analysis has a long history addressing a wide range of clinical problems including developmental disabilities, ADHD, anxiety and psychotic disorders among others. It is characterized by pre-intervention identification of variables that control the reliably observed behavior(s) of interest, learning interventions based on pre-intervention assessments and the use of natural change agents. Conceptually parallel interventions may occur with topographically distinct target behaviors and topographically similar behavior may be treated very differently, depending upon its function. Examples of function-based treatments for varied problems in a variety of different populations and contexts will be given.

The Effects of VTA AMPA Receptor Blockade During Cocaine Seeking in Rats
Brian C. Nolan, Ph.D.

The role of mesolimbic dopamine (DA) in incentive motivation for natural and drug reward continues to be investigated and debated (e.g. Wise, *Nature Reviews Neuroscience*, 2004). Since cocaine seeking is an incentive behavior, it may be mediated in part by the mesolimbic DA system, originating in the ventral tegmental area (VTA) (e.g. Everitt & Robbins, *Nature Neuroscience*, 2005). Furthermore, the activity of mesolimbic DA cells is influenced by glutamate release (e.g. Takahata & Moghaddam, *Journal of Neurochemistry*, 2000) in the ventral tegmental area (VTA), the site of origin of these cells. Thus, AMPA receptor stimulation in the VTA may play a role in cocaine-seeking. To further investigate this idea, rats were prepared with intravenous jugular catheters and trained to self-administer cocaine during daily 2-hr sessions. During each session animals could press an active lever, resulting in an intravenous injection of cocaine (1.0 mg/kg) and a cue light above the lever, or an inactive lever, producing no consequences. After 10 days of stable responding the rats were tested in two separate extinction sessions. One extinction session had discrete cues (light stimulus and pump activation delivering saline) delivered in response to the active lever press and the other session has no discrete cues. Each

extinction session was separated by 3 intervening self-administration sessions and the sequence of extinction session type was counterbalanced across subjects. Prior to each extinction session each rat received bilateral microinjections of NBQX (AMPA receptor antagonist; 1.0 µg/0.5 µl or vehicle) into the VTA. Results suggest a trend for NBQX to enhance lever pressing, an effect that is greater when the discrete cues are present than when not. These results suggest that NBQX in the VTA enhances the effectiveness of conditioned stimuli in cocaine-seeking.

An Examination of Cognitive and Emotional Empathy in Asperger Syndrome
Kimberley Rogers (Borod Lab)

Research has demonstrated that empathy is comprised of at least two components, cognitive and emotional empathy, which are both neuroanatomically and functionally dissociable. A deficit in empathy has consistently been cited as a central characteristic of Asperger Syndrome (AS), although some research has suggested that this deficit may be specific to cognitive empathy and not to emotional empathy. One limitation of this research is that no current measure exists that comprehensively assesses both components of empathy simultaneously. Thus, the goal of the current study was to describe a newly developed measure of empathy, the *Cognitive and Emotional Empathy Questionnaire (CEEQ)*, and to use this measure to assess empathy in AS. The psychometric characteristics of the CEEQ (i.e., test-retest reliability, split-half reliability, internal consistency, and construct validity) of the CEEQ were assessed in a sample of healthy adults (n = 123). In addition, sixteen individuals with AS and thirteen healthy adults completed the CEEQ, along with other measures of social cognition. Results indicate that the CEEQ has high levels of reliability and construct validity. Furthermore, AS participants scored significantly lower than the healthy controls on the cognitive subscales of the CEEQ and on one of the emotional empathy subscales (Empathic Concern). However, individuals with AS did not differ from healthy controls on another emotional empathy subscale (Mirroring). These findings provide some indication that individuals with AS may not have pervasive deficits in emotional empathy, despite clear difficulties with cognitive empathy. Moreover, the CEEQ appears to be a reliable and valid instrument that can be used to characterize both the cognitive and emotional components of empathy.

Keynote Lecture

Jonathan D. Cohen, M.D., Ph.D.

Eugene Higgins Professor of Psychology
Director, Center for the Study of Brain, Mind and Behavior
Director, Program in Neuroscience
Princeton University

Optimization of Decision Making and Cognitive Control:Formal Models, Behavior, and Neural Mechanisms

Most behavior can be described as a series of decision making operations (for example, what source of information should be attended? what response should be made?). Cognitive control is the ability to guide these decisions in accord with a particular goal, and a critical function of cognitive control is, presumably, the optimization of the relevant decision making processes in the service of satisfying that goal. Until recently, there has been little formal understanding of the mechanisms that underlie decision making or cognitive control, at either the psychological or neurobiological levels. However, recently this has begun to change. In this talk, I will provide an overview of computational modeling and mathematical analysis that has begun to provide an outline of an elementary, but elegant theory regarding at least simple forms of decision making and control. This theory — the Drift Diffusion Model — provides a mathematical description of the processes responsible for making a choice between two alternatives in terms of a stochastic process influenced by a constant bias term that represents the strength of available evidence favoring one alternative over the other. Analysis of the model can be used to derive parameters for optimal function, which in turn can be used to describe how control processes may serve to optimize performance. I will review computational modeling work describing neural mechanisms that implement these processes, including the influence of neuromodulatory systems, and the

results of mathematical analyses that generate novel predictions regarding their function that can be tested in both neurobiological and behavioral studies.

Session IV

Behavioral Regulation of Neuronal Lifespan in the Adult Zebra Finch Model System
Sara Wildstein (Pytte Lab)

Neuron replacement continues throughout adulthood in nucleus HVC of the song production pathway. Several studies suggest that one function of ongoing HVC neuron incorporation is to provide a substrate for motor learning of song patterns. Therefore, adult-formed neuron survival could be based on the extent to which a cell participates in the attainment of the target song pattern. We tested this idea by experimentally manipulating song acoustic structure in adult male zebra finches and comparing degree of song recovery (return to pre-op song) with the survival of new neurons in HVC. To alter song, we paralyzed the ventral syrinx muscles with botulinum toxin (botox), causing distorted motor output during singing. Birds were given botox 3 days after cell birthdating with BrdU (10 µg/ml, 3 x day, 4 days). Thirty days after birthdating, we quantified HVC cells double-labeled with antibodies to BrdU and the neuronal marker protein Hu. We found that song recovery was positively correlated with the percentage of new neurons in HVC. There were no effects of botox treatment on HVC volume or total neuron number. Two hypotheses can account for these data: 1) birds are monitoring the accuracy of their songs, and newly incorporated HVC neurons are retained or rejected as a function of this assessment or 2) birds with naturally high rates of neuronal turnover (not in response to manipulation) may be better able to compensate for the effects of song distortion by modifying song motor commands. Experiments are underway to resolve these possibilities. Both scenarios are consistent with the notion that new HVC neurons provide plasticity for adaptive modifications used to achieve a target song.

Finding Mr. Wrong: Divergences in Mate Preferences and Mate Selection
Claudia Brumbaugh, Ph.D.

Research has shown that when people are asked to choose among partner prototypes in the laboratory, they show a strong preference for secure over insecure individuals. In reality, however, some people end up in relationships with insecure partners. In this talk I present some work aimed at understanding this discrepancy and exploring some of the possible mechanisms behind it. I examined whether insecure people initially present themselves as more secure than they really are, and if they rely on any self-presentation strategies that may make them more attractive. I found that insecure individuals presented themselves in a positive light to potential mates. Anxious people also seemed as secure as genuinely secure people. These results suggest insecure people have some positive personality characteristics that may allow them to create a good first impression and win over dating partners.

Are Saccades During Memory Search Epiphenomenal? Saccadic Suppression Does Not Affect Performance on Non-visual Cognitive Tasks Characterized By High Eye Movement Rate
Dragana Micic, Ph.D.

People often move their eyes at rates of about 1 per second while engaged in long-term memory retrieval. It is not known if these eye movements are functional; however, if they do serve a function, we would expect that restricting eye movements would impede performance on such tasks. The effect of fixation on semantic memory was assessed by within-subject manipulation of gaze instructions for two phonemic fluency tasks: A-fluency and F-fluency. The effect of fixation on episodic memory was examined with between-subject manipulation of gaze instructions during free recall of words reported in the A-fluency task. No significant difference between performance on the semantic and episodic memory tasks under gaze fixation and eyes-free condition was found. These results suggest that suppression of eye movements does not impede performance on phonemic fluency and free recall tasks.

Noradrenergic Modulation of Attention
Suzanne Clerkin (Halperin Lab)

The pontine nucleus locus coeruleus (LC) plays a crucial role in the regulation of alerting and arousal states. The LC, which contains most of the noradrenergic (NA) neurons in the brain, receives multimodal sensory afferents from select nuclei, and in turn, sends diffuse efferents throughout the neuraxis, with particular innervation of areas associated with attention (i.e., thalamus, parietal cortex, and prefrontal cortex [PFC]). Behaviorally salient stimuli evoke large phasic increases in LC firing, and the resultant rise in synaptic NA increases the signal-to-noise ration of neurons in terminal regions, including the thalamus, inferior (LPi) and superior parietal lobules (LPs), supplementary motor area (SMA), and PFC. There is considerable evidence that the neural network of alerting is substantially influenced by the actions of α_{2A} adrenoceptors. However, definitive conclusions about the regulatory mechanisms of NA within the alerting system cannot be made due to confounding factors of previous methodologies. Preliminary data from a functional magnetic resonance imaging study of a Guanfacine challenge of the noradrenergic system during a simple reaction time task will be presented.

Vascular Depression: A Distinct Diagnostic Entity
Joel R. Sneed, Ph.D.

Vascular depression has been described as a valid diagnostic subtype of late-life depression. However, research to date has focused exclusively on the external validity of the illness (e.g., course of illness, symptom profile, response to treatment). The internal validity of the illness (its structure) has yet to be examined. Dr. Sneed will provide a model for evaluating and establishing the validity of psychiatric diagnosis that depends on both internal and external validity and present the first data supporting the construct's internal validity.

Long-term effects of VEGF administered during status epilepticus
Janice Lenzer (Croll Lab)

Vascular endothelial growth factor (VEGF) is an angiogenic growth factor with demonstrated neuroprotective effects. We have previously shown that administration of exogenous VEGF protein directly into hippocampus results in significant preservation of hippocampal pyramidal cells after pilocarpine-induced status epilepticus. While it is desirable to protect neurons from death after status epilepticus, preservation of normal functioning is the ultimate goal of this protection. The current experiment was conducted to determine if the significant preservation of neurons observed 24 hours after status epilepticus would lead to preservation of normal behavior. Either 60 ng/d VEGF (experimental group) or vehicle (seized controls) was administered to the dorsal hippocampus continuously via osmotic minipump starting five days before exposure to pilocarpine-induced status epilepticus and ending 2 weeks later. A third group of animals received saline instead of pilocarpine, and hence served as non-seized controls. Behavioral tests were conducted starting 2 weeks after status, and continued for 2 weeks before animals were sacrificed one month after status epilepticus. The behavioral tasks assessed spatial learning and memory (Morris water maze), exploratory locomotion (grid locomotor activity), and anxiety (light-dark exploration task). Subsequently, animals were sacrificed and CA1 neuronal density estimates were determined using StereoInvestigator software to identify the extent of long-term neuronal loss. While VEGF-treated animals showed water maze performance intermediate to that of the non-seized and vehicle animals, both groups of seized animals performed significantly worse than the non-seized group in the acquisition trials and the spatial probe trial of the water maze. In contrast to the findings in the water maze, VEGF-treated animals showed a significant preservation of normal anxiety functioning relative to their vehicle controls. Indeed, their anxiety did not differ from that of the non-seized animals. These data suggest a selective profile of functional preservation with intra-hippocampal VEGF treatment. Cells counts conducted in CA1 of the hippocampus suggested that the neuronal protection observed 24 hours after status epilepticus was not maintained at the same level during the first month after status. More research will be necessary to determine

whether sustaining the initial level of protection would lead to more functional preservation of spatial memory than observed in the current study.

Neuropsychology Ph.D. Subprogram Colloquia Fall 2007

Thursday	August 23	**Welcome New Neuropsychology Graduate Students**
Friday	September 7	5^{th} **Annual Neuropsychology Research Day** (Rosenthal Library 230, 9:00 AM – 5:30 PM) **Jonathan D. Cohen, M.D., Ph.D.** Princeton University
Wednesday	September 19	**Laura Rabin, Ph.D.** Brooklyn College, CUNY *Memory Self-Appraisal in Older Adults with Mild Cognitive Impairment and Cognitive Complaints: Insights from Neuropsychology & Neuroimaging*
Monday	October 1	**Ofer Tchernichovski, D.V.M., Ph.D.** City College of New York, CUNY
Wednesday	October 24	**Randy Bruno, Ph.D.** Columbia University *Strengths & Weaknesses of Thalamocortical Synapses*
Wednesday	November 14	**George Huntley, Ph.D.** Mount Sinai School of Medicine *More Missions for Matrix Metalloproteinases: Novel Roles for Extracellular Proteolysis in Remodeling Synaptic Connections*
Monday	November 26	**5th Annual Alumni Speaker** **Effie Mitsis, Ph.D.** Mount Sinai School of Medicine *SPECT Imaging of B_2-Nicotinic Acetylcholine Receptor Occupancy and Availability in Smokers, Aging and Alzheimer's Disease*
Monday	December 3	**John DeLuca, Ph.D.** Kessler Medical Rehabilitation Research and Education Center *What Do We Know About Fatigue in Clinical Populations?*

Seminars are open to the public and held at 12:15PM in the Razran Room (SB E-308).
For further information contact Joshua C. Brumberg, Ph.D., joshua.brumberg@qc.cuny.edu.