Program of the 110th Meeting of the Society of Experimental Psychologists

University of Virginia—Charlottesville

April 17–18, 2015

April 16
Courtyard Charlottesville—Medical Center
Albemarle Room

7:00–9:30—Reception

April 17
Courtyard Charlottesville—Medical Center
Albemarle Room

9:00–12:00—Morning Session (Chair: Michael Kubovy)

9:00–9:15

Opening. David Hill, *University of Virginia.*—Words of welcome by the Chairman of the Psychology Department.

9:15–9:40

Exploration vs. Exploitation in the proactive brain. Bar, Moshe *Bar Ilan University.*—It is argued that the brain is a proactive organ, striving to know what is next. But not always. There are states when we want to learn, and states when we prefer to exploit the certainty of a predictable environment; our minds sometime seek to maximize the absorption of novel information, and in other times it prefers to minimize surprise. This constant tension between exploration and exploitation modes will be illustrated through a discussion of top-down and bottom-up processing, mental simulations, the influence of load, and the role of familiarity. Implications to topics such as creativity, anxiety and mood will be proposed.
Email: moshe.bar@biu.ac.il

9:40–10:05

How popular movies have changed, and some psychological implications. Cutting, James E. *Cornell University.*—Between 1935 and the present time popular movies have undergone significant changes, many of which seem have important psychological implications. I'll talk about changes in average shot durations, aspect ratios, shot scales, luminance and luminance contrast, motion, the number of characters in shots, and more, each of which has implications for eye movements, attention, or our sense of involvement in the movie. And more focally, I will talk about how filmmakers have recrafted the types of shots that they use to intensify the sense of continuity. Unfortunately, movies have not really improved. Mark Twain was interested in "good stories, well told." This talk is about the telling, not the stories.
Email: james.cutting@cornell.edu

10:05–10:30

From active 3D vision to invariant object learning, recognition, and search. Grossberg, Stephen *Boston University.*—How do we learn to recognize an object under unsupervised free-scanning conditions? How do our brains learn to associatively link multiple views of the same object into an invariant object category while our eyes search a scene, even before we have a concept of the object? Why do not our eyes move around randomly? How do they explore salient features of novel objects and thereby enable us to learn view-, size-, and positionally-invariant object categories? How do boundary, surface, and object representations of a 3D scene remain binocularly fused as our eyes explore it? How do we search a scene for a desired object? This talk will summarize the ARTSCAN family of neural models that clarifies how the brain solves these problems in a unified way by coordinating processes of 3D vision and figure-ground separation, spatial and object attention, invariant object category learning, predictive remapping, and eye movement search.
Email: steve@bu.edu

10:30–10:45—Break

10:45–11:10

How do we know our action boundaries? Weast, Rebecca and Proffitt, Dennis *University of Virginia.*—Action boundaries are the extent over which an action can be performed. The extent of our reach is an important action boundary, and oddly, most studies in the literature suggest that people overestimate this extent. Two studies were designed to show that this overestimation is an artifact of experimental procedures and instructions. It was found that, despite our best efforts, participants continued to overestimate their reach. A third study looked at whether situation-specific reaching experience would result in better calibrated judgments. Participants moved beads on a table either with vision - visual and proprioceptive feedback - or with their eyes closed - proprioceptive feedback alone. It was found that judgments were improved equally in both conditions. It is concluded that people do overestimate their reach and that situation-specific experience is required to calibrate judgments to a particular place. Moreover, it appears that proprioceptive experience alone is sufficient to evoke calibration.
Email: drp@virginia.edu

11:10–11:35

Mobile conjugate reinforcement revisited. Kelso, Scott *Florida Atlantic University.*—The late theoretical biologist Robert Rosen (1934–1998) once told me that the most abstract thing you can do is an experiment. "Because it means you know what to measure", he said. I examine the early (quite beautiful) experiments on Mobile Conjugate Reinforcement (MCR) and some of their more modern, technically adept successors. I find the interpretation of this body of experimental work, interesting though it is, to be limited by the measurements made, which may obliquely be called "organism-centered." When one examines these experiments using the concepts, methods and tools of coordination dynamics, an extended interpretation is possible that may yield insights into the dynamical (and developmental) origins of conscious agency.
Email: kelso@ccs.fau.edu

11:35–12:00

Event memory: A theory of memory for laboratory, autobiographical, and future events. Rubin, David C. *Duke University.*—An event memory is a mental construction of a scene recalled as a single occurrence. At recall, the construction of a past or future event requires a scene, without which the recall would be context-free knowledge. All scenes are constructed from a location and that location introduces the "self" as an observer. The ventral stream and hippocampus are needed to construct scenes; their damage disrupts both scene construction and memory for events. Event memory differs from episodic memory in that it does not conflate the independent dimensions of whether or not a memory is relived, is about the self, is recalled voluntarily, or is based on a single encoding with whether it is recalled as a single occurrence of a scene. Support comes from research across species including neuroimaging, neuropsychology, behavior, and phenomenology.
Email: david.rubin@duke.edu

12:00–2:00—Lunch

2:00–5:35—Afternoon Session (Chair: Timothy Salthouse)

2:00–2:25

The structure of lives: Flat or hierarchical? Kubovy, Michael *University of Virginia.*—Kahneman, in his "Thinking Fast and Slow" distinguishes between two selves, the "Experiencing Self" (ES), which answers questions like, Does it hurt now?, and the "Remembering Self" (RS), which answers questions like How bad (or good) was the experience on the whole?. He claims that the RS—which governs what we learn from living and makes decisions—to paradoxical results, because it confuses experience with the memory of it. In contrast, the ES — which sums the momentary utilities of experiences — is the normatively correct way to assess well-being. Here I show that this approach leads to a conception of lives as "flat." I contrast this with an approach that describes lives as hierarchically-organized structures common to all humans, which has deep implications for our conceptualization of well-being.
Email: kubovy@virginia.edu

2:25–2:50

Comparison of a quantum cognition model vs. a generalized exemplar model of performance on the categorization & decision task. Busemeyer, Jerome and Nosofsky, Robert *Indiana University.*—In a categorization & decision making task, participants are shown pictures of faces: In one condition, they are asked to categorize the face presented on the trial as belonging to a "good guy" or "bad guy" category, and then they were asked to decide to take an "attack" or "withdraw" action; in another condition, the same participants made an action decision alone without being asked to categorize the face first. An interference effect is defined as the difference between the probability of "attacking" on decision-alone trials as compared to the total probability of "attacking" on category-decision trials. These interference effects pose a challenge for many traditional cognitive models, such as Markov models or signal detection models. However, both quantum and exemplar models can account for this effect, and so a quantitative comparison of the accuracy of each model was performed to determine the best model for explaining these interference effects.
Email: jbusemeyer@indiana.edu

2:50–3:15

Learning at low and high levels of a category hierarchy. Nosofsky, Robert *Indiana University.*—Suppose that one's goal is to teach students to classify at a high superordinate level (e.g., igneous, metamorphic, sedimentary rocks). Each superordinate category is divided into subtypes (some examples of igneous rocks are granite, rhyolite, and obsidian). Is it better to train directly at the high superordinate level, or might learning benefit through indirect training at the subtype level? Our preliminary research suggests that the answer depends on whether the category structure is compact or dispersed. Formal models are tested on their ability to predict learning at different levels of the category hierarchy in experiments that vary the structure of the to-be-learned categories.
Email: nosofsky@indiana.edu

3:15–3:40

Illumination constancy in the perception of 3D shape from shading Todd, James T. *The Ohio State University.*—A fundamental difficulty for computational analyses of 3D shape from shading is that objects can be observed with a wide range of possible patterns of illumination. To investigate the ability of human observers to cope with these changes, we obtained local orientation judgments of smoothly shaded surfaces illuminated from different directions by large area lights, both with and without visible smooth occlusion contours. Using a least-squares procedure on these data we computed a best-fitting surface that was maximally consistent with the overall pattern of observers judgments. Over 88% of the variance between observers' judgments and the simulated objects could be accounted for by an affine correlation. The presence or absence of visible smooth occlusion contours had a negligible effect on performance, but there was a small effect of the illumination direction, such that the response surfaces were sheared slightly toward the light source. These shearing effects were much smaller, however, than the effects produced by changes in illumination on the overall pattern of luminance or luminance gradients.
Email: todd.44@osu.edu

3:40–3:55—Break

3:55–4:20

The interface of memory and perception. Barense, Morgan *University of Toronto.*—How does the act of perceiving an object influence how one will subsequently remember it? A central assumption in most modern theories of memory is that memory and perception are functionally and anatomically segregated. For example, amnesia resulting from medial temporal lobe (MTL) lesions is traditionally considered to be a selective deficit in long-term declarative memory with no effect on perceptual processes. The work I will present offers a new perspective. Through a series of studies using converging methodology (fMRI, behavioural and eye-movement analyses in patients with MTL damage), I will provide support for the notion that memory and perception are inextricably intertwined and rely on shared neural representations and computational mechanisms.
Email: barense@psych.utoronto.ca

4:20–4:45

A neurocomputational account of the face configural effect. Biederman, Irving, Xu, Xiaokun, Shah, Manan P., and Herald, Sarah B. *University of Southern California.*—A striking phenomenon in face perception is the configural effect in which a difference in a single part appears more distinct in the context of a face than it does by itself. Remarkably, there has never been a biologically plausible explanation of this fundamental signature of face recognition. We show that the configural effect can be simply derived from a model composed of overlapping receptive fields (RFs) characteristic of early cortical simple-cell tuning. Because of the overlap in RFs, the difference in a single part is not only represented in the RFs centered on it, but also propagated to larger RFs centered on distant parts of the face. Dissimilarity values computed from the model between pairs of faces and pairs of face parts closely matched the recognition accuracy of human observers who had learned a set of faces composed of composite parts and were tested on wholes and parts.
Email: bieder@usc.edu

4:45–5:10

Social priming and the replicability crisis. Pashler, Hal *UCSD*, Rohrer, Doug *University of South Florida* and Haris, Christine *UCSD.*—Cognitive psychologists have uncovered a variety of perceptual and cognitive priming effects using statistically powerful research designs, and these effects have proven robust and reproducible. However, in the past 15 or so years, a much wider range of intriguing "social" or "behavioral" priming effects have been reported, usually emerging from statistically low-powered between-subject designs. The dramatic character of some of these effects has drawn broad attention across the psychology field and beyond. In this talk, I will describe how curiosity (and later, growing puzzlement) led us to try to replicate many of the best-known social priming findings (many from John Bargh's and Kathleen Vohs's work), unaware that several other cognitive psychologists around the world were also making similar efforts. More recently, organized multi-lab efforts have evaluated some of the same effects. The striking failure of all these efforts to confirm social/behavioral priming claims has led us to ponder how the communal enterprise of science and scientific publication can sometimes yield what appears to be broad support for nonexistent effects. My talk will conclude with a few reflections on publication bias, the role of direct vs. conceptual replication, and the vexing problem of how to align scientists' incentives with the search for truth.
Email: hpashler@gmail.com

5:10–5:35

Frontal cortex physiology and human behavior. KNIGHT, ROBERT T. *University of California, Berkeley.*—Direct cortical recordings obtained from humans (electrocorticography; ECoG) has shown that every cognitive process examined including language, attention, memory, perception and motor control generates spatially restricted high frequency activity (60–250 Hz, high gamma; HG). HG activity has also been shown to be phase locked to the trough of lower cortical rhythms (phase-amplitude coupling; PAC) with different tasks eliciting unique PAC spatial patterns. This transient coupling between low– and high-frequency brain activity provides a mechanism for communication in distributed neural networks engaged in goal-directed behavior. ECoG data on the role of human prefrontal cortex in executive control of language, attention and decision-making will be reviewed. The HG response also provides a powerful tool for brain machine interfaces and work on the development of an auditory speech prosthesis will also be reviewed.
Email: rtknight@berkeley.edu

April 18
Newcomb Hall—South Meeting Room

9:00–11:45—Morning Session (Chair: Judy DeLoache)

9:00–9:25

Constructing universal emotion perception. BARRETT, LISA FELDMAN *Northeastern University.*—Using a series of studies, I will test the hypothesis that robust evidence for universal emotion 'recognition' can be constructed using a particular configuration of experimental methods. A key feature of universality appears to be ensuring that US emotion concepts are primed or taught during the experimental procedure. Implications for the study of emotion, for child development, and for cross-cultural competency training will be discussed.
Email: l.barrett@neu.edu

9:25–9:50

The importance of prediction and expectations in eye movement control. KOWLER, EILEEN *Rutgers University.*—The ability to make accurate predictions about the future states of the world is critical for effective motor control. This is true not only for movements of limbs, but also for the movements of the eye (smooth or saccadic). Even though eye movement systems can process and react to sensory signals quickly, accurate predictions are nevertheless crucial for overcoming the harmful effects of processing delays. The research I will describe will encompass several situations in which the predictions we make about the future state of the world determine (with little overt effort on our part) the properties of our eye movements, including the direction or speed of smooth pursuit, and the timing patterns of saccades. Predictions are important for eye movements, not only to overcome processing delays, but also to reduce the load attached to processing sensory input, and allow a pattern of efficient decision-making that frees central resources for higher level aspects of the task.
Email: kowler@rci.rutgers.edu

9:50–10:15

A fuzzy trace theory of risky decision making. REYNA, VALERIE F. *Cornell University.*—Understanding risky decision-making is central to economic and psychological theory. Fuzzy-trace theory builds on prior theory, but makes unique predictions about the causes, development, and malleability of risk preferences. It differs from other dual-process models in distinguishing impulsivity from intuition and in emphasizing that intuition is advanced. Most important, fuzzy-trace theory emphasizes that simple gist representations of the meaning of information underlie insightful intuition. These assumptions explain adolescent risk taking, much of which is surprisingly cold and calculating (rather than emotional and impulsive) as well as the growth of reliance on gist-based intuition with experience and expertise. Tested in randomized controlled experiments, the theory has been successfully applied to such domains as HIV prevention, medication decisions, and breast cancer and genetic risk.
Email: vr53@cornell.edu

10:15–10:30—Break

10:30–10:55

Heterogeneity without heteroscedasticity in age-cognition relations. SALTHOUSE, TIMOTHY *University of Virginia.*—It is well established that increased age is associated with lower levels of functioning on a wide variety of cognitive tasks, and that there is considerable variability (heterogeneity) in the level of performance at any given age. Although it is often assumed that some people age more gradually than others, results from standardized tests administered to nationally representative samples of adults often find little or no evidence of increases in variance with increased age (i.e., heteroscedasticity). In this talk I will describe new results relevant to the issue of heterogeneity without heteroscedasticity, and discuss implications for the interpretation of age-related cognitive changes.
Email: salthouse@virginia.edu

10:55–11:20

Concept learning of ecological and artificial stimuli in rhesus macaques. TERRACE, HERBERT and GREG JENSEN *Columbia University.*—The study of concepts in animals is complicated by the possibility that performance reflects reinforcement learning of particular discriminative cues, which might be used to categorize stimuli. To minimize that possibility, we trained 7 rhesus macaques to respond, in a specific order, to 4 simultaneously presented exemplars of different perceptual concepts. We drew these exemplars at random from large banks of images and varied them on every trial. Ss nevertheless identified and ordered these stimuli correctly. Three Ss learned to correctly order ecologically-relevant concepts; 4 Ss, to order close-up sections of paintings by 4 artists with distinctive styles. Furthermore, 6 Ss (3 using ecological stimuli and 3 using paintings) transferred these concepts to novel stimuli. Our results suggest that monkeys possess a flexible ability to form class-based perceptual concepts that cannot be explained as the mere discrimination of physical features.
Email: hst1@columbia.edu

11:20–11:45

Galton Meets Goldberg: Subjective forecasting of continuous variables. WALLSTEN, THOMAS S., TIDWELL, JOE W. and MOORE, DON *The University of Maryland.*—This research develops methods for modeling and aggregating continuous probability distributions from relatively few discrete judgments by individual forecasters. The work has applications in probabilistic forecasting of continuous variables such as dates by which events of national security interest may occur, the number of measles cases to expect within the year or future unemployment levels. Our results provide compelling evidence that accurate continuous subjective probability forecasts can be modeled from a small set of discrete ordinal forecasts, and that these continuous distributions can be aggregated to yield consensus distributions that consistently outperform the average forecaster. Open questions include which families of distributions perform best under which conditions, how to handle situations in which no particular distribution applies and best ways to estimate confidence intervals for consensus distributions.
Email: tswallst@umd.edu

11:45–2:00— Group photo & Lunch

2:00–4:45—Afternoon Session (Chair: Dennis Proffitt)

2:00–2:25

Young children's understanding of Skype Interactions. DELOACHE, JUDY *University of Virginia.*—Video chatting has revolutionized the interactions of young children with parents and grandparents who cannot interact face-to-face. How well do these children understand these interactions?

In three studies, 18– to 32–month-olds ($N = 104$) initially encountered a woman and various objects during a video chat and they later had a live encounter with her and the objects. They were able to recognize some aspects of what they had seen earlier, indicating that they had paid attention to the video chat. The older children readily recognized the person and toys that they had encountered during their interaction. However, the younger children (18– to 24–month-olds) had substantial difficulty recognizing the person. We interpreted this difficulty as a problem understanding the nature of the relation between the display on the screen and real life—in other words, a problem with understanding the symbol-referent relation involved in video chatting.
Email: jdeloache@virginia.edu

2:25–2:50

The local coupling between neighbors in a virtual crowd. Warren, William H. and Rio, Kevin W. *Brown University.*—The collective behavior of human crowds is thought to emerge from local interactions between pedestrians. We investigate the visual coupling between a pedestrian and their neighbors, in order to explain the coordination of walking speed and heading direction. A participant "walked together" with a virtual crowd of 12 simulated humans presented in a head-mounted display. On each trial, a subset of virtual neighbors changed speed or heading, and the participant's speed and lateral position were measured. First, we find that neighbor influence is additive: participant responses increased linearly with the number of neighbors in the subset ($p < 0.001$). Second, coupling strength decreases with distance ($p < 0.001$). Third, responses depended on crowd density ($p < 0.01$), suggesting that the neighborhood structure is metric (fixed radius) rather than topological (N nearest neighbors). This characterization of the local coupling places strong constraints on models of collective crowd dynamics.
Email: Bill_Warren@brown.edu

2:50–3:15

The predictive brain in perception and memory. Zacks, Jeffrey M. *Washington University in St. Louis.*—In this talk I will describe a theory that relates subjective features of the stream of consciousness to computational mechanisms of prediction error monitoring and memory updating. Briefly, Event Segmentation Theory proposes that perceivers maintain a working memory representation of the current event and use it to guide predictions about what will happen in the near future. When prediction error spikes, they update their model. This theory has implications for perception, long term memory encoding, and action control. I will describe recent studies testing these hypotheses using behavioral and neuroimaging methods in younger adults, healthy older adults, and older adults with mild dementia.
Email: jzacks@wustl.edu

3:15–3:40

A new perspective on binaural integration using response-time methodology: Super capacity revealed in conditions of binaural masking release. Lentz, He and Townsend, James *Indiana University, Bloomington.*—This study applied reaction-time based methods to assess the workload capacity of binaural integration by comparing reaction time distributions for monaural and binaural tone-in-noise detection tasks. In the diotic contexts, an identical tone + noise stimulus was presented to each ear. In the dichotic contexts, an identical noise was presented to each ear, but the tone was presented to one of the ears 180° out of phase with respect to the other ear. Accuracy-based measurements have demonstrated a much lower signal detection threshold for the dichotic versus the diotic conditions, but accuracy-based techniques do not allow for assessment of system dynamics or resource allocation across time. Further, reaction times allow comparisons between these conditions at the same signal-to-noise ratio. Here, we apply a reaction-time based coefficient, which provides an index of workload efficiency and quantifies the resource allocations for single ear versus two ear presentations.
Email: jtownsen@indiana.edu

3:40–3:55—Break

3:55–4:20

Perceptual learning through reweighting: Feedback and bias. Dosher, Barbara *University of California, Irvine.*—Perceptual learning improves how we see visual stimuli and is the basis of visual expertise. This talk considers how the Augmented Hebbian Reweighting Model and its extension the Integrated Reweighting Theory relate to plasticity and stability of visual representations, and how they account for broad phenomena in perceptual learning involving feedback and induced biases.
Email: bdosher@uci.edu

4:20–4:45

Bayesian induction, model comparison and reproducibility. Shiffrin, Richard M. and Chandramouli, Suyog *Indiana University.*—There have been many technical advances in recent years concerning methods for scientific induction: These include variants of the principles of Bayesian Model Selection (BMS) and Minimum Description Length that are used to compare models based on our prior beliefs and the current data. We present an extension of BMS that infers the probability that a model instance or class provides the best approximation to the true generating distribution. This extension simplifies the theory to the point that it can be explained in a single table, without equations. Using the table one can see how to represent our knowledge, carry out induction, compare models, and assess reproducibility.
Email: shiffrin@indiana.edu

4:45–5:15

Business Meeting. Nosofsky, Robert M. *SEP Secretary-Treasurer.*
Email: nosofsky@indiana.edu

April 18
Courtyard Charlottesville—Medical Center
Albemarle & Rivanna Rooms

6:15–7:00

Pre-dinner cocktails.

7:00–10:00

Banquet and presentation of awards. Nosofsky, Robert M. *SEP Secretary-Treasurer.*
Email: nosofsky@indiana.edu