

Fall Meeting of the Comparative Cognition Society 2009



November 19, 2009
Sheraton Boston Hotel
(Meeting Room: Back Bay Ballroom A)

www.comparativecognition.org

Fall Meeting of the Comparative Cognition Society 2009

All Sessions Held in Back Bay Ballroom A

8:50	Imitation and Social Cognition
9:40	Timing
10:30	Spatial Cognition
11:00	Associative Processes
11:40	Lunch Break
1:10	Metacognition and Self-Control
1:40	Perception and Categorization
2:50	Change Detection, Discrimination, & Choice
4:00 – 5:00	Keynote Presentation – Earl Miller

Important Note to Presenters: Talks should be no longer than eight minutes (two additional minutes scheduled for discussion and transition)

Comparative Cognition Society

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Please consider joining us in March for the 17th Annual *International Conference on Comparative Cognition*

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CCS thanks the Psychonomic Society for its support and help

This conference is funded in part by a grant from the Science Directorate of the American Psychological Association

Imitation & Social Cognition

Session Chair: Michael Brown

8:40	Welcome and Introduction
8:50	Yael Klein & Robert G. Cook (Tufts University) <i>Discrimination of Action Categories by Pigeons</i> Detecting behaviors of other animals is an important skill for pigeons. While the discrimination of noun categories has been well established in pigeons, action categories have received far less attention. We trained four pigeons to discriminate digitally rendered videos of walking and running animals. The pigeons easily acquired this discrimination independent of the orientation, elevation, and distance at which the animals were presented. They successfully transferred this discrimination to novel animals. The results of the experiments support the possibility that pigeons are able to form action categories.
9:00	Kelly Jaakkola, Emily Guarino, & Mandy Rodriguez (Dolphin Research Center) <i>Do What You Hear: A Dolphin's Use of Sound Cues to Imitate Motor Behaviors</i> Using a variation of the "Do-as-I-do" procedure, we investigated the ability of a bottlenose dolphin to copy thirty behaviors of another dolphin while blindfolded (i.e., wearing eyecups). The blindfolded dolphin was able to copy both vocal and motor behaviors. During this task, he echolocated during many, but not all, of the motor behaviors, suggesting that he was able to recognize some behaviors by their characteristic sounds, while using echolocation to recognize others. Such flexibility in using multiple perceptual routes to motor imitation has never before been documented in nonhuman animals.
9:10	Skyler S Place, Peter M Todd (Indiana University)& Lars Penke (University of Edinburgh) <i>Humans Show Mate Copying After Observing Real Mate Choices</i> When searching for a mate, one must gather information to determine the mate value of potential partners. By focusing on individuals that have been previously chosen by others, one's selection of mates can be influenced by another's successful search – a phenomenon known as mate copying. We show mate copying in humans with a novel methodology that closely mimics behavioral studies with non-human animals. After viewing instances of real mating interest in video recordings of speed-dates, both male and female participants demonstrate mate copying effects for short-term and long-term relationship interest when they perceived the dates as successful. Furthermore, attractiveness plays a mediating role in whom an individual will choose to copy.
9:20	Jan K Tornick (University of New Hampshire) <i>Inferring the Location of Food Using Human-Given Cues by Clark's Nutcrackers (<i>Nucifraga columbiana</i>)</i> The ability of non-human animals, particularly primates, to utilize human gestures to identify the location of hidden food has been intensively investigated over the past decade. The ability of other animals to use human gestural cues has been less well studied, however. We tested the ability of six Clark's nutcrackers to use gaze, point, and touch cues in a two-way object-choice task to identify the location of hidden food. Most of the birds were able to use touching cues during the first trial of testing and were able to learn to use pointing and gazing cues after 30 trials. The performance of non-social nutcrackers is similar to that of more social birds, suggesting that species with very different evolutionary histories can utilize human gestures.
9:30	Alejandra Rossi, Emily Cahill & Colin Allen (Indiana University) <i>Intentional Behavior in Dog-Owner and Dog-Unfamiliar Person Communication</i> In this paper we investigated under what conditions showing behavior (transferring of information in an active way from the dog to the owner) emerges in dogs. In order to study this, the dogs were observed under two different experimental conditions; in experiment 1 the presence of familiar humans and/or hidden food was manipulated. In Experiment 2, we replicated experiment 1 but manipulated the familiarity factor; thus, experiment 2 included an unfamiliar person to the dog. We also analyzed the relation between the owner- dog relationship and the way the dog behaved in the communication task by analyzing video tapes of free playing time. We hypothesized that if the owner-dog relationship was more interactive, the dogs would tend to do more showing behavior than if the relationship was less interactive.

Timing

Session Chair: Jon Crystal

- 9:40 **Wenyi Zhou & Jonathon D. Crystal (University of Georgia)**
Evidence for Remembering When Events Occurred in a Rodent Model of Episodic Memory
Episodic-like memory in rats has been argued to be qualitatively different from human episodic memory because rather than remembering when an earlier past event occurred, rats used the cue of how long ago it occurred. Our study investigated whether rats remember when they encountered a distinctive event, in addition to what and where it happened. Rats were tested in the morning and afternoon on separate days. A distinctive flavor (chocolate) was replenished at a daily-unique location at only one of these times. The interval between first and second daily opportunities to eat (study and test, respectively) was constant. Rats adjusted their revisits to the chocolate location at different times of day by remembering when this recent episode occurred rather than the cue of how long ago it occurred. At the time of memory assessment, rats remember when a recent episode occurred.
- 9:50 **Marina Menez and Florente López (Universidad Nacional Autónoma de México)**
Evidence of Simultaneous Timing in a Peak Procedure with Gaps
Previous research has shown that the maximum response rate of rats in a peak procedure with gaps depends on the time at which there is a gap in the stimulus. This has been used to support a memory-decay explanation (Cabeza de Vaca, Brown & Hemmes, 1994) rather than a clock-mode explanation (Roberts & Church, 1978). We explore the possibility that shifts in the peak time depend on the rate of responding at the moment of the gap introduction, using a modified peak procedure with gaps, in rats. With a wider distribution of the times of a gap, qualitatively different forms of the response gradients were observed that support a simultaneous-timing interpretation with multiple time markers.
- 10:00 **Rebecca Rayburn-Reeves, Jessica Stagner & Tom Zentall (University of Kentucky)**
Pigeons' Acquisition of Simultaneous Discrimination Midsession Reversal
When pigeons are trained with matching-to-sample that switches to oddity-from-sample midway through each session they begin to switch prior to the change in contingency and show poor accuracy after the change in contingency (Cook, 2008). This premature switch and delayed response to the switch results in relatively poor accuracy and it suggests that the pigeons' choices are governed by the interaction of matching and oddity generalization gradients. In the current study we asked if similar results would be found with simple simultaneous color discrimination (one color was correct for half of the session and the other color was correct for the remainder of the session). Preliminary results suggest that pigeons show a steeper yet similar transition function with this simpler task.
- 10:10 **Angelo Santi and Allison Adams (Wilfrid Laurier University)**
The Effect of Variable Training Delays on Rats' Memory for Event Duration in Delayed Matching-to-Sample with Nonspatial Comparison Response Alternatives
Rats were trained in a symbolic delayed-matching procedure to discriminate 1.2- and 4.8-s of magazine light illumination. The delay interval (DI) on training trials was randomly varied between 0 and 8 s. In the last block of training, accuracy was significantly above chance for all combinations of sample duration and delay interval except for the short sample at an 8-s delay. During DI testing with an extended delay of 16 s, accuracy remained above chance on long-sample trials, but it did not drop significantly below chance on short-sample trials. The present procedure successfully reduced the tendency for rats to time during the DI, but it did not result in a choose-short effect. The results do not support the hypothesis that temporal memories in rats subjectively shorten over time.

10 Minute Break

Spatial Cognition

Session Chair: Tom Zentall

- 10:30 **Bradley R. Sturz (Armstrong Atlantic State University), Debbie M. Kelly (University of Saskatchewan), & Michael F. Brown (Villanova University)**
Facilitation of Learning Spatial Relations Among Locations in the Absence of Coincident Visual Cues
Participants searched in a real-environment or 3D virtual-environment for four hidden goal locations arranged in a diamond configuration within a 5 x 5 matrix. Participants were randomly assigned to one of three groups: Pattern-Only, Landmark+Pattern, Cues+Pattern. Participants experienced a Training phase followed by a Testing phase. During Training, visual cues were coincident with goal locations for the Cues+Pattern group whereas one visual cue at a non-goal location maintained a consistent spatial relationship with goal locations in the Landmark+Pattern group. Groups were tested in the absence of visual cues. Participants learned the spatial configuration of goal locations. When visual cues were removed during Testing, performance of the Landmark+Pattern and Cues+Pattern groups did not differ and was superior to the Pattern-Only group. Results suggest that learning based upon spatial relations among locations may not be susceptible to cue-competition effects and that facilitation of learning spatial relations does not require coincident visual cues.
- 10:40 **Toru Betsuyaku (Kyoto University), Noriyuki Nakamura (Chiba University, JSPS), & Kazuo Fujita (Kyoto University)**
*Further Analyses on the Use of Beacon and Geometric Cues in Syrian Hamsters (*Mesocricetus auratus*)*
In an earlier study, we showed that Syrian hamsters used both geometric and feature information in a redundant context (Betsuyaku, Nakamura, & Fujita, 2009 at CO3). Here, we report further experiments on their use of spatial information. Subjects (Syrian Hamsters, n=11) and apparatus (a semicircle-like arena with 3 goals) were the same as those in the previous study. In training, one of the 3 goals of the arena was unlocked, whereas the others were locked. A beacon was placed near the unlocked goal. We trained hamsters to pass through the unlocked goal and then tested in the arena where all goals were unlocked. In the test of Experiment 1, the beacon was removed from the arena. In Experiment 2, the beacon was relocated near the goal that had been locked in the training. In both experiments, some hamsters switched the information they used depending upon the test context. We discuss the flexibility of their use of geometric and feature information.
- 10:50 **Eric L. G. Legge, Marcia L. Spetch (University of Alberta) & Ken Cheng (Macquarie University)**
*Landmark, Compass and Context Use in the Solitary Foraging Australian Desert Ant, *Melophorus bagoti**
Many ant species travel large distances to find food, sometimes covering distances that are up to 1 million times their body length (Wehner et al., 1996). Even when these foraging trips follow convoluted paths, the ants usually find their way back to their nest with precision (Wehner, 1996). Specific mechanisms that ants use to return to their nest vary across species. We present two experiments conducted in the central Australian desert on a solitary foraging ant: *Melophorus bagoti*. We tested foragers' ability to exit a circular arena which provided an undifferentiated panorama. Artificial visual landmarks were located near a small exit. On tests in which path integration information was not available, foragers did not use artificial landmarks as beacons. Instead, they appeared to learn a context-specific compass direction in which to orient. Artificial landmarks, although not used as beacons, appeared to form part of the learned context. Specifically, ants oriented toward the learned compass direction when the landmarks were present, regardless of location. When the landmarks were removed, ants oriented randomly.

Associative Processes

Session Chair: Jeff Katz

- 11:00** **Cynthia D. Fast & Aaron P. Blaisdell (UCLA)**
The Role of Hidden Events in Positive and Negative Patterning in Rats
We investigated the role of ambiguous information about a cue on conditioned responding. Rats first received positive (A-, B-, AB+) or negative (A+, B+, AB-) patterning treatment with two visual cues (A and B) and a food outcome (+). Subjects were subsequently tested on A-alone probe trials, during which B's lamp was either covered (ambiguous absence) or uncovered (explicit absence). When uncovered, performance on test trials with A alone was similar to that during training, while with B's light covered, performance was intermediate between levels shown on A alone and on AB compound training trials. Covering B's lamp at test had a much stronger effect on Negative than on Positive patterning. This asymmetry was found in both Pavlovian (Experiment 1) and Instrumental (Experiment 2) procedures and has interesting implications for representational processes engaged in problem solving.
- 11:10** **Bridget L. McConnell (Binghamton University), Kouji Urushihara (Health Sciences University of Hokkaido), Yumu Tanaka, & Ralph R. Miller (Binghamton University)**
A Novel Means of Differentiating Between Accounts of Retrospective Revaluation
Three conditioned suppression experiments with rats investigated contrasting predictions made by the extended comparator hypothesis and acquisition-focused models of learning, specifically, modified SOP and the revised Rescorla-Wagner model, concerning retrospective revaluation. Two target cues (X and Y) were partially reinforced using a stimulus relative validity design (i.e., AX-Outcome/ BX-No outcome/ CY-Outcome/ DY-No outcome), and subsequently one of the companion cues for each target was extinguished in compound (BC-No outcome). In Experiment 1, which used spaced trials for relative validity training, greater suppression was observed to target cue Y for which the excitatory companion cue had been extinguished relative to target cue X for which the nonexcitatory companion cue had been extinguished. Experiment 2 replicated these results in a sensory preconditioning preparation. Experiment 3 massed the trials during relative validity training, and the opposite pattern of data was observed. The results are consistent with the predictions of the extended comparator hypothesis. Furthermore, this set of experiments is unique in being able to differentiate between these models without invoking higher-order comparator processes.
- 11:20** **Mario A. Laborda, James E. Witnauer, & Ralph R. Miller (SUNY-BINGHAMTON)**
Modeling Anxiety Disorders: S-R Associations, Their Extinction and Relapse
Associative accounts of the etiology of fear have been criticized because of numerous cases in which clients do not remember a traumatic event with the phobic object. In three lick suppression experiments with rats, we modeled an associative account for such fears. Experiment 1 sought stimulus-responses associations in first-order fear conditioning. After behaviorally complete devaluation of the unconditioned stimulus, the target stimulus still produced strong conditioned responses, suggesting that a stimulus-response association had been formed. Experiment 2 demonstrated extinction of stimulus-response associations and showed that extinguished stimulus-response associations returned when testing occurs outside of the extinction context (i.e., renewal). Experiment 3 found that a delay between extinction and testing also produced a return of the extinguished stimulus-response associations (i.e., spontaneous recovery). The results suggest that fears for which people can not recall causes can be explained in an associative framework, and that those fears are susceptible of relapse after extinction.
- 11:30** **James E. Witnauer & Ralph R. Miller (SUNY-Binghamton)**
Total error reduction: Data and simulations
Most models of human and animal learning assume that total error across a stimulus compound is necessary for learning. This idea has been implemented in connectionist and artificial neural network models to describe the conditions under which weights between units will change. Using a computational modelling approach, we compared a total error reduction model of associative learning to a similar model that rejects the total error reduction assumption and instead uses local error reduction. The simpler local error reduction model was able to fit some behavioral and neurobiological data that were considered exclusively supportive of the total error reduction approach. Moreover, the local error reduction model provided a superior fit to results that are problematic for the total error reduction approach.

Break for Lunch 11:40 – 1:10

Metacognition and Self-Control

Session Chair: Kelly Jaakkola

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| 1:10 | <p>Joseph Boomer (University at Buffalo, The State University of New York)
<i>Discerning the Cognitive Level of Uncertainty Monitoring in Humans and Rhesus Macaques</i>
Some researchers say that the Uncertainty Response (UR) indicates a fully conscious metacognitive process. Others say that it is a low-level, behavioral response. To clarify this issue, we are conducting an experiment with macaques that studies the UR's cognitive level. We use two categorization tasks. One task requires implicit (non-conscious, procedural) learning for optimal performance. The other requires explicit, conscious learning. Monkeys classify stimuli varying on two dimensions into one of two categories, or decline the trial using the UR. Monkeys will make less frequent, less appropriate URs when categorizing implicitly and procedurally, if their higher-level uncertainty system has poor access to the implicit-learning system. Monkeys will make adaptive URs when explicitly categorizing, if their higher-level uncertainty system has easy access to the explicit category-learning system.</p> |
| 1:20 | <p>Justin J. Couchman (University at Buffalo), Michael J. Beran (Georgia State University), & J. David Smith (University at Buffalo)
<i>Recognizing Future Uncertainty</i>
Metacognition, the ability to monitor first-order mental states, has often been studied using paradigms that only require one decision. A reflective metacognitive capacity should also show itself during temporally extended problems in which several decisions must be made prior to a behavioral response. To explore this reflective capacity comparatively, we presented humans and monkeys with three pairs of pixelated boxes and asked them to decide which box in each pair had fewer pixels. Before beginning each series of discriminations, they were required to accept or decline the entire series. They were rewarded only when all three decisions were made correctly. Humans and monkeys declined series that contained difficult pairs. Moreover, their latencies to decline trials were longer when the difficult pair was farther into the series. This reaction-time pattern is consistent with the idea that subjects planned the series of discriminations cognitively. Evidently, humans and monkeys can recognize and respond adaptively to future perceptual difficulty.</p> |
| 1:30 | <p>Holly Miller, Kristina Pattison, Rebecca Rayburn-Reeves, Nathan DeWall, Thomas Zentall (University of Kentucky)
<i>Canine Self-Control is Not Qualitatively Different from Human Self-Control; Both Rely on a Common Metabolic Process</i>
Self-control constitutes a fundamental aspect of human nature. Yet there is reason to believe that human and non-human self-control processes share common biological mechanisms. Two experiments tested the hypothesis that canine self-control depends on the same limited energy resource as human self-control. Experiment 1 showed that canines that exerted self-control on an initial task, compared to those who did not exert self-control initially, persisted for a shorter time on a subsequent task. Experiment 2 demonstrated that providing canines with a boost of glucose eliminated the negative consequences of prior self-control exertion on persistence as it appears to do for humans. These findings provide the first evidence that self-control relies on the same limited energy resource among humans and non-humans, with broad implications for the study of self-control processes in human and non-human species.</p> |

Perception and Categorization

Session Chair: Suzanne MacDonald

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| 1:40 | <p>Robert G. Cook and Carl Erick Hagmann (Tufts University)
<i>Discrimination of Occluded Line Segments by Pigeons</i>
The ability to integrate occluded line segments is fundamental to coherent object recognition. Humans perceive continuity among line segments even if they are partially occluded, given sufficient relatability between the lines. There is evidence that pigeons can discriminate between continuous and discontinuous line segments, but there is little information about the effects of relatability. We tested four pigeons with two white lines occluded by a green circle or square. Manipulations of angle and size suggest that pigeons are able to judge mood continuity under specific conditions.</p> |
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1:50	<p>Lauren Guillette, Laurie Bloomfield, Emily Batty, Michael Dawson & Chris Sturdy (University of Alberta) <i>Black-capped and Mountain Chickadee Contact Calls Contain Species, Sex, and Individual Features</i> The tset contact call, common to both black-capped and mountain chickadees, is among the most frequently produced call of each species, but has remained little studied until now. Here we characterize the tset call of black-capped and mountain chickadees using nine acoustic features. Summary statistics, the potential for individual coding and classification by linear discriminant analysis are used to describe the tset call. LDAs correctly classify tset calls by group or individual with high accuracy. Furthermore, several acoustic features are highly individualized, indicating that the chickadees may use these features to identify signalers as individuals or members of a particular group. Our next step will involve the use of Artificial Neural Networks (ANNs) to further guide the operant discrimination experiments.</p>
2:00	<p>Marisa Hoeschele (University of Alberta), Ron Weisman (Queen’s University) & Chris Sturdy (University of Alberta) <i>Octave Generalization in Humans and Songbirds: Could They Share Musical Perception?</i> Songbirds are often used as models for the evolution of language learning because of their similar vocal development. In addition, it is thought that modern human music and language may have the same evolutionary origins. Thus, the study of songbirds, with regards to basic music perception, may be fruitful. Octave generalization, or the ability to treat notes with a doubling of frequency as the same note, is a basic part of human musical perception. In past studies, songbirds have failed to generalize to octaves, however, humans also fail to generalize to octaves in some experimental contexts. We replicated an experiment with humans that originally showed a failure of European starlings to generalize to octaves. We found that humans also failed to generalize to octaves in this task, unless they were members of a rare group of absolute pitch possessors. We discuss the implications of these results and address what we believe should be the next step for human-songbird biomusicology comparisons.</p>
2:10	<p>Chris Sturdy, Lauren Guillette, Tara Farrell, Marisa Hoeschele, Carly Nickerson & Michael Dawson (University of Alberta) <i>Peak Shift in a Multidimensional Note-Type Continuum</i> We trained black-capped chickadees and artificial neural network (ANN) simulations in an effort to further examine the mechanisms of call note category perception. We compared speed of acquisition among discrimination groups and searched for evidence of peak shift using note type (multidimensional) stimuli. Earlier ANN data motivated the current studies. ANNs revealed differences in the speed of learning among note-type discrimination groups related to the degree of perceptual similarity among the three note types tested. In many respects, bird and network results were in agreement but they also differed in important ways. Our results clarify the possible factors influencing note type perception and add to the body of evidence that peak shift can be observed in discriminations involving multidimensional stimuli.</p>
2:20	<p>Matthew S. Murphy & Robert G. Cook (Tufts University) <i>Spatial Frequency Use in Picture Processing in Pigeons (Columba livia)</i> Spatial frequency may play an important role in pigeon picture processing. We trained four pigeons in a four-choice picture discrimination task and tested them with pictures from which one spatial frequency octave was removed. Further test trials consisted of two overlapping competing pictures, each consisting of either high or low spatial frequencies. Results show that high frequencies are most important, but lower frequencies may play a secondarily important role.</p>
2:30	<p>Fabian A. Soto & Edward A. Wasserman (University of Iowa) <i>The Relative-Validity Effect in Natural Image Categorization by Pigeons</i> We tested the prediction, advanced by a common-elements model of natural image categorization, that different stimulus attributes compete for control of performance in category learning. We trained pigeons on two Go/No-Go tasks. In the Uncorrelated task, pecks to 20 exemplars from one category were reinforced 50% of the time. In the Correlated task, training involved 20 exemplars from a second category, half reinforced and half nonreinforced. In each task, the category was reinforced and nonreinforced the same number of times; however, in the Correlated task, reinforcement and nonreinforcement could be predicted by information specific to each image, which should weaken stimulus control by category-specific properties. The results of a transfer test confirmed the prediction of our model: greater stimulus generalization in the Uncorrelated than in the Correlated task.</p>
10 Minute Break	

Change Detection, Discrimination, and Choice

Session Chair: Olga Lazareva

2:50	<p>Vasconcelos M., Aw, J., Monteiro, T., & Kacelnik, A. (University of Oxford) <i>Choice by Temporal Cross-Censorship: Experimental Tests of the Sequential Choice Model</i> According to the Sequential Choice Model, latencies to accept options presented alone can predict preferences between options when they occur simultaneously. Latencies to accept single options reflect a tendency to reject it in favour of continuing to search in background. With training, each alternative forms a specific probability density function of latencies. When two or more options are met simultaneously, the animal draws independent samples from these latency distributions and choice occurs by temporal cross-censorship: the shorter latency constitutes a choice. Contrary to alternative models, there is no time-consuming evaluation at the time of choice. We offer new evidence supporting this model using a variety of procedures, including risky choice, comparative valuation and multi-alternative scenarios, wherein European starlings (<i>Sturnus vulgaris</i>) encounter food sources either alone or simultaneously. Consistent with the model, latencies to accept options presented alone reliably predicted preference in subsequent choice trials.</p>
3:00	<p>Daniel Brooks, Ka Ng, Eric Buss, John Freeman, Ed Wasserman (University of Iowa) <i>Visual Discrimination in Rats Using a Touchscreen</i> We gave rats a touchscreen-based visual discrimination task involving three displays (“Links”) per trial. In Link 1, we showed rats one of four textures in the center of the screen; this texture was from one of two orthogonal dimensions, line orientation or brightness. In Link 2, we showed rats identical stimuli on the sides of the screen, either near to or far from the center stimulus location. In Link 3, we replaced one of these stimuli with a concentric circle, whose location was predicted by the pattern shown in Links 1 and 2. Rats predominantly chose the Link 2 stimulus that appeared in the location of the upcoming Link 3 stimulus. Rats also exhibited anticipatory touches to the Link 1 stimulus in the appropriate spatial direction. Transfer tests, which examined generalization to intermediate orientations and brightness levels, found strong control by both dimensions.</p>
3:10	<p>Jouseph Barkho and Jerome Cohen (University of Windsor) <i>Factors Affecting Rats’ Object Change Detection Accuracy</i> We report a series of experiments in which rats have to detect a change the location of a familiar object or the replacement of a familiar object with a new object or both. We report a series of experiments that examines the accuracy for detecting such a change when only a subset of objects within an array of a fixed number of objects is ever likely to contain the changed object. The questions asked in these experiments are whether the number of objects within this set and the type of change affects rats’ change detection accuracy and whether their accuracy is related to their ability to terminate searching behaviour during the foraging test segment of a trial. We maintain that such information is crucial to determine possible higher cognitive processes in rats’ optimal foraging behaviour.</p>
3:20	<p>Jessica P. Stagner (University of Kentucky), Jerome Alessandri (Universite de Lille III, France) & Thomas R. Zentall (University of Kentucky) <i>Maladaptive Gambling Behavior by Pigeons</i> Humans show maladaptive gambling behavior. According to optimal foraging theory, animals should not be susceptible to this type of behavior. We tested this hypothesis by giving pigeons a choice between two keys, one that resulted in 20% reinforcement, the other in 50% reinforcement. If they chose the 20% reinforcement alternative, on 20% of the trials they received, for example, a red light that was always followed by reinforcement and on 80% of the trials they received a green light that was never followed by reinforcement. If they chose the 50% reinforcement alternative, they received a blue light or a yellow light each associated with 50% reinforcement. We found that the pigeons showed a strong preference for the 20% reinforcement alternative. This result suggests that pigeons are as susceptible to maladaptive gambling behavior as humans and that it is likely that this behavior has a biological basis.</p>

3:30

Duncan A. White (Rhode Island College)

Individual Differences in Preparedness and Learning Behavior of Grain Beetles (*Tenebrio molitor*)

Individual differences are not often addressed by experiments on insect behavior. Accordingly, 40 subjects were given 3 bias trial sessions (15 trials per session for 3 consecutive days) in a T-maze, on the third day following metamorphosis. Twenty-one of those subjects demonstrated no significant left/right turning preference (less than 30 turns in the same direction) and were then exposed to at least 24 consecutive days of forced-choice escape learning trials (10 trials per session, 1 session per day) against their turning tendency. Significant differences in two-tailed paired t-test comparisons suggest discrimination learning. In addition, significant differences in learning behavior were evidenced among individuals.

3:40

Kristina F. Pattison, Holly C. Miller, & Thomas Zentall (University of Kentucky)

Do Dogs Benefit From Labels?

Recently, domestic dogs have demonstrated the ability to spontaneously select the matching comparison toy in a delayed matching to sample task (Kaminski, et al., 2008). That finding contrasts with the results of others who have found that dogs require over 600 trials to acquire a MTS task (Callahan, et al., 2000) and some dogs never acquire the task (Unpublished data). One explanation for this discrepancy is that the dogs most recently tested had experience matching verbal labels to objects. To determine whether verbal labels affect the ability to spontaneously match to sample, two dogs were tested using familiar objects. One-half of the objects were given verbal labels and the other half were not. Dogs were subsequently tested with a DMTS task with the familiar objects but without the associated verbal labels to determine whether verbal labels affected choice accuracy.

10 Minute Break

Keynote Address

Earl Miller (Massachusetts Institute of Technology)

Introduced by Marcia Spetch

4:00

The Prefrontal Cortex: Brain Rhythms and Cognition

What controls your thoughts? How do you focus attention? How do you know how to act while dining in a restaurant? This is cognitive control, the ability to organize thought and action and direct them toward goals. Results from our laboratory have shown how cognitive control may arise from rhythmic interactions between neurons in the prefrontal cortex (the brain area that is most highly developed in the primate brain) and related brain areas. These neurons are involved in directing attention, in recalling stored memories, predicting reward value, and they synthesize the diverse information needed for a given goal. Perhaps most importantly, they transmit acquired knowledge. Neurons in the prefrontal cortex reflect learned task contingencies, concepts and rules. In short, they seem to underlie our internal representations of the "rules of the game" needed for goal-directed behavior.

Please Consider Joining the Comparative Cognition Society

Founded in 1999, the Comparative Cognition Society (CCS) is a scientific society dedicated to gaining a broad scientific understanding of the nature and evolution of cognition in human and nonhuman animals. The Comparative Cognition Society is a nonprofit scientific society with no doctrine or philosophy, except the scientific method as it is commonly understood in all natural sciences. Anyone who studies perception, learning, memory, or any other cognitive or representational process in animals is welcome. Our members include faculty members, animal behavior professionals, and students in psychology, biology, anthropology, applied animal behavior science, and related fields.

Membership in the society supports the following activities:

- A primary activity of CCS is sponsorship of the annual International Conference on Comparative Cognition (CO3), which has been held annually each March in Melbourne, Florida since 1994. Both Faculty/Professional Scientist members and Student members of CCS receive a discount on CO3 conference fees. To promote student interest in comparative cognition, student conference fees are kept at a minimum. CCS sponsored a second conference in 2008 (Fall conference held in Chicago in coordination with the annual meeting of the Psychonomic Society).
- CCS has been a leader in electronic publishing and in an effort to provide the products of our science to scientists, students, and the general public at no cost and in a format that allows dynamic illustrations of animal behavior and analyses of that behavior. The current portfolio of electronic publications supported by members of the society includes:
 - *Comparative Cognition and Behavior Reviews* - The first four volumes of this annual online journal of reviews are available.
 - Two cyberbooks have been published in cooperation with the society
 - *Avian Visual Cognition*
 - *Animal Spatial Cognition: Comparative, Neural, and Computational Approaches*
 - *Proceedings of the Annual Conference on Comparative Cognition* - conference proceedings include some full-text PowerPoint™ presentations

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