Fall Meeting of the Comparative Cognition Society 2012

October 12, 2012
8:15 AM
Marlborough A&B
Hilton New Orleans Riverside
New Orleans, LA

Fall Meeting of the Comparative Cognition Society 2011

All Sessions Held in Marlborough A&B

8:15-9:10	Communication, Sensation & Perception
9:20-10:00	Categorization, Attention & Physical Cognition
10:10-11:00	Memory
11:00-12:30	Lunch Break
12:30-1:20	Learning, Variability & Reward
1:30-2:20	Space and Time
2:30-3:20	Pattern Learning & Data Mining
3:30-4:30	Keynote Presentation – Onur Güntürkün

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

Comparative Cognition Society

President: Jeff Katz
Secretary: Olga Lazareva
CO3 Conference Chair: Debbie Kelly
Treasurer: Mike Brown

Fall Conference Committee: Olga Lazareva, Brett Gibson, Kim Kirkpatrick, Martin Acerbo, Aaron Blaisdell, Stephen Fountain, Kristy Gould

Please consider joining us in March for the 19th Annual *International Conference on Comparative Cognition*

www.comparativecognition.org

Communication, Sensation & Perception

Session Chair: Aaron Blaisdell

8:15	**Welcome and Introduction**
8:20	Stan Kuczaj (University of Southern Mississippi), Holli Byerly (Dolphins Plus), Shaun Perisho (University of Southern Mississippi), & Brittany Jones (University of Southern Mississippi) **Individual Dolphin Mothers Use Unique Signals to Call Their Calves** When dolphin mothers were asked to retrieve their calves, they typically use acoustic signals to do so. Analyses of these signals revealed that individual mothers used different signals to recall their calves, and that the same mother used different signals to recall different offspring. The implications of these results for the notion that some dolphin signals may function as “names” will be considered.
8:30	Joshua Downer & Mitch Sutter (UC Davis) **Auditory Feature-Selective Attention in Rhesus Macaque** Selective attention to auditory features constitutes a critical skill for animals in a dynamic environment. Most research into auditory selective attention in rhesus macaques has focused on attention to features between spatial locations or sensory modalities. Thus, how rhesus macaques attend specific acoustic features within the same acoustic object and how their performance on such tasks compares to humans remain unknown. In the present study, humans ($n = 3$) and rhesus macaques ($n = 2$) were cued to selectively attend one of two features (amplitude-modulation or bandwidth restriction) within the same auditory object (a broadband noise carrier presented from a single speaker) and to report the presence of the cued feature in a 2-alternative forced choice task. Performance, as measured by perceptual thresholds and reaction time, suffered for both humans and macaques when both the cued and non-cued features were present, but disproportionately more for macaques. To our knowledge, these results are the first evidence of attention to auditory features within the same object in rhesus macaque.
8:40	Tadd B. Patton (Augusta State University), Scott A. Husband (University of Tampa), Toru Shimizu (University of South Florida) **Conspecific Stimuli Trigger Immediate Early Gene Expression in Pigeons** Activation of the immediate early gene zenk is believed to be one of the first steps in the formation of long-term memories associated with a given stimulus. Here, we investigated the distribution of ZENK protein in brain regions thought to be involved in the processing of social stimuli, such as a potential mate. Male pigeons (Columba livia) were exposed to: a live conspecific, a videotaped conspecific, and a videotaped heterospecific bird. The results showed more ZENK expression in "association" regions of the telencephalon when the stimulus was a live conspecific compared to the other stimuli. These findings will be discussed in regard to: the visual presence of a potential mate, the presence of nonvisual signals, the quality of the image, and the real-time interaction with the stimulus.

8:50	Heather Hill (St. Mary's University, San Antonio, TX), Natalie Baus (O'Connor High School, San Antonio, TX), and Stan Kuczaj (University of Southern Mississippi, Hattiesburg, MS) **Preliminary Evidence for Visual Laterality in Belugas (*Delphinapterus leucas*) But Not in Pacific White-Sided Dolphins (*Lagenorhynchus obliquidens*) When Viewing Familiar and Unfamiliar Humans** Lateralization of skills is well documented in many species. Cetaceans are known to display lateralized behaviors including swim patterns, visual investigations, and affiliative contact between conspecifics. However, less is known about the lateral processing of familiar and unfamiliar humans in belugas or Pacific white-sided dolphins (lags). During free swims, 8 belugas or 6 lags were presented with one of three stimuli: a familiar human (i.e., trainer), an unfamiliar human, or a control (i.e., no human). The results indicated that belugas gazed at unfamiliar humans significantly longer than familiar humans whereas the lags gazed at unfamiliar humans significantly shorter than familiar humans. Belugas displayed a trend for a left eye preference with unfamiliar humans and a right eye preference for familiar humans. Lags did not show a clear lateralized visual investigation. These results partially corroborate previous research demonstrating lateralized eye preferences in bottlenose dolphins (Tursiops truncatus) and wild beluga mother-calf interactions. The results also provide evidence that belugas and lags discriminate between familiar and unfamiliar humans, a topic not formally addressed previously.
9:00	Martin Acerbo (University of Iowa), Olga Lazareva, John McInnerney, Emily Leiker (Drake University), Amy Poremba, and Edward Wasserman (University of Iowa) **Metabolic Activity of Nucleus Rotundus and its Inhibitory Complex Associated with Figure-Ground Discrimination in Pigeons** Although much is known about the anatomical structure of the avian visual pathway, its functional organization is largely unexplored. To pinpoint the areas associated with figure-ground segregation, we used a radioactively labeled glucose analog to compare differences in glucose uptake after figure-ground, color, and shape discriminations, as well as in control group. We concentrated on a nucleus rotundus (Rt) and two nuclei providing regulatory feedback, pretectum (PT) and nucleus subpretectalis complex (SP/IPS). Figure-ground discrimination was associated with strong activity of Rt and SP/IPS, whereas color discrimination produced strong activation in Rt only. Shape discrimination was associated with lower activity of Rt than in the control group. The results suggest that figure-ground discrimination is associated with Rt and that SP/IPS may be a main source of inhibitory control.
9:10	**Ten Minute Break**

Categorization, Attention & Physical Cognition

Session Chair: Kim Kirkpatrick

9:20

Thomas A. Daniel (Auburn University), Anthony A. Wright (The University of Texas Medical School at Houston), Jeffrey S. Katz (Auburn University)

Pigeons Learn a Pseudo-Concept by Item-Specific Learning

Katz & Wright (2006) expanded training set sizes to demonstrate same/different concept learning in pigeons. In the intermediary sets (between 8 and 1024-item sets), evidence of partial-concept learning in pigeons was discovered, which is to say that pigeons demonstrated transfer performance above chance but below baseline. The present study's aim is to determine how acquisition and transfer performance would appear if all configurations were learned through memorization. Holding all other aspects of the procedure constant, a pseudo-categorical design was created by arbitrarily assigning configurations as being same or different. By forcing pigeons to learn this same/different task item-specifically, transfer performance and rates of acquisition were compared across set size to the 2006 study. Where the Katz & Wright (2006) showed gradual transfer and savings in acquisition, the present study confirmed the hypothesis that arbitrary assignment of stimulus pairs eliminates transfer, acquisition savings and concept learning.

9:30

Adam Goodman, Thomas Daniel, John Magnotti (Auburn University), Anthony A. Wright (UT Medical), & Jeffrey Katz (Auburn University)

Pseudo-Concept Learning in Humans

Humans trained and tested in a simultaneous 2-item same/different task with picture stimuli demonstrated use of relational rules regardless of the number items used in training. A pseudo same/different task was generated which was designed to reflect how one would be required to learn the same/different task by memorizing the correct responses to each configuration rather than using relational rules. Four categories of trials were arbitrarily assigned to either True Same, Pseudo Same, True Different, and Pseudo Different. Configurations assigned to either pseudo category required opposite responses to those assigned to the True category which shares their relation (i.e. same, different). The results suggest relational rules were used by some humans on all trials despite the task demands. The comparative implications of the results will be discussed.

9:40	Justin J. Couchman (Fredonia State University) **Identifying Self-Controlled Actions in Complex Environments** Converging evidence in comparative cognition has shown that some animals have the ability to monitor their mental states, and some understand relationships between kinesthetic information and perceived events. Recent work has shown that at least two species, chimpanzees and rhesus monkeys, have a sense of self-agency. This is the understanding that some events are self-caused. The reported experiments asked humans and rhesus monkeys to complete a computer-based task that required the identification of self-caused actions. Participants moved a cursor with a joystick while different types of distractor cursors also moved onscreen. After the movements, participants chose between the controlled cursor and possible distractors. Unlike previous tasks in which the controlled and distractor cursors moved toward specific targets, in the reported paradigm participants were free to make any movements they chose.
9:50	Kristy Gould, Abigail Seyfer, Debra Hansberry, Emily Lynn, Quinn Meyer & Rose Brantner (Luther College) **Performance of Blue Jays on a Two-Choice Functional Tool Task** Many animals use tools, including birds, but they may not understand the function of the tool they are using. Captive blue jays have demonstrated spontaneous tool making and using in the past. Therefore, we investigated the ability of blue jays to choose a functional tool in a two-choice task in order to retrieve food that was out of reach. The tools included whole pieces of cloth, cut pieces of cloth, and pipe-cleaner hooks. We presented four test trials per day of each of the three tool conditions sequentially. During the whole cloth condition, two birds chose the functional tool significantly above chance levels. During the cut cloth condition, one of the same birds chose the functional tool above chance. During the hook condition, the other bird chose the functional tool above chance. This indicates that some birds had the ability to learn about the functionality of tools they had never used before
10:00	**10 Minute Break**.

Memory

Session Chair: Olga Lazareva

10:10	A. George Wilson & Jonathon D. Crystal (Indiana University) **Strategic Prospective Memory in the Rat** Rats possess prospective memory (i.e., they “remember to remember”). Their ongoing task performance degraded when expectation of a future meal was maximal in a previous study; these deleterious effects are the operational definition of prospective memory. In the current studies, a warning signal (an event) was played 10 minutes before a meal was earned. In study 1, the meal was delivered 90 minutes after the start of the session. In study 2, the meal occurred either 35 or 260 minutes after the start of the session. Deleterious effects and meal expectation were equally influence by time since the start of the session and the event in Study 1, but deleterious effects and meal expectation was influenced mostly by the event in Study 2. Rats strategically utilize the predictiveness of environmental stimuli when using prospective memory.
10:20	Jonathon D. Crystal, Wesley T. Alford & Wenyi Zhou (Indiana University) **Source Memory in the Rat** Source memory is a representation of the origin–source–of information and is related to episodic memory. We developed an animal model of source memory by asking if rats can remember self-generated (walking along a runway, encountering food) and experimenter-generated (placement at a food site without walking) events. Placement occurred at randomly selected chocolate- or chow-baited arms of a radial maze. The source of chocolate determined its replenishment in a subsequent test. Chocolate arms were revisited at a higher rate in replenishment than non-replenishment conditions. Performance transferred to a different room. Source memory decayed during delays whereas flavor-location memory was intact. Temporary inactivation of the hippocampus, a region critical for episodic memory, eliminated source memory whereas performance in control conditions was intact. Rats remember source information about flavors and locations.
10:30	Deepna Devkar (University of Texas Health Science Center, Houston), Jeffery Katz (Auburn University), & Anthony Wright (University of Texas Health Science Center, Houston) **Proactive Interference in Visual Short-term Memory** Short-term memory is affected by its capacity, decay, forgetting, and proactive interference from previously encountered stimuli. Repeating the same stimuli across trials creates proactive interference. In this research, we controlled and systematically manipulated proactive interference by placing potentially interfering stimuli in prior trials; repetitions of stimuli across other trials were avoided to minimize the background level of proactive interference. Monkeys and humans were tested in a same/different task by placing potentially interfering stimuli as the sample stimulus 1, 2, 4, 8 or 16 trials prior to the test trial where this same stimulus was the test stimulus, but differed from the sample stimulus. Interference was greatest the closer the interference was to the test. Manipulations of time intervals (e.g., delay) were made to compare the effects of proactive interference on monkeys and humans.

10:40	Toni-Moi Prince, Mathieu Wimmer, Sara Aton, Jennifer Choi, Robbert Havekes, and Ted Abel(University of Pennsylvania) **Time Course of Sleep Deprivation in Modulating Memory and Synaptic Plasticity** Chronic sleep loss leads to severe deficits in the ability of the organism to express proper cognitive function. Our lab has previously demonstrated that brief bouts of sleep deprivation of six hours impair hippocampal function, required for episodic memory formation. The purpose of this project is to examine the temporal dynamics of sleep deprivation, both in terms of period length and onset time post-learning, to determine the critical window when sleep deprivation impairs hippocampus-dependent memory consolidation in mice. Mice were sleep deprived for decreasing time increments with onset occurring at varying hours post training in the spatial object recognition task(SOR). Long-term memory was assessed 24 hours later. Spatial memory in this task was impaired with 6 hours and 4 hours of sleep deprivation occurring immediately post-training. Memory was also impaired when the animal was subjected to 3 hours of sleep deprivation post-task training, with onset occurring 1 hour following training. The temporal dynamics of sleep deprivation sufficient to impair hippocampal synaptic plasticity, the neural correlate of hippocampus-dependent memory consolidation, was also examined. Mice were sleep deprived for decreasing time increments and long-term potentiation (LTP) maintenance was examined. LTP maintenance was impaired by 5 hours and 4 hours of sleep deprivation. These findings suggest that a minimum of 3 hours of sleep deprivation is sufficient to impair hippocampal function.
10:50	David N. Harper (Victoria University of Wellington) **Increased Trial Separation Can Ameliorate a Drug-Induced Proactive Interference-Based Disruption to Delayed Matching-to-Sample Performance in Rats** Recent evidence suggests that acute exposure to amphetamine-based drugs such as (+/-)3,4-methylene dioxymethamphetamine (MDMA) disrupts delayed matching-to-sample (DMTS) performance as a result of increased confusion between previous-trial and current-trial events. The current study tested this hypothesis by examining the effects of MDMA on performance of rats in a DMTS procedure when the length of the inter-trial interval (ITI) was altered. Consistent with the possibility that limiting the conditions under which responses made on a previous trial would interfere with current-trial choice, a 15-s ITI ameliorated the disruptive effects caused by MDMA on trial performance when the ITI was 5 s. Therefore, the disruptive effects of MDMA on memory can be attenuated methods that separate current-trial “to-be-remembered” events from previous-trial events.
11:00	**Lunch Break**

Learning, Variability & Reward

Session Chair: Kristy Gould

12:30 Cynthia D. Fast & Aaron P. Blaisdell (UCLA)

The Role of Learning History on Use of Imagery in Rats

Fast & Blaisdell (2011) demonstrated that prior learning influenced how rats behaved in ambiguous situations. Specifically, rats that had learned positive patterning did not respond differently at test when a cue was occluded from view (ambiguously absent) compared to when it was explicitly absent. Rats that had learned negative patterning, however, did discriminate these test situations; emitting significantly more instrumental lever presses when the cue was explicitly absent compared to when it was ambiguous - suggesting an image of the absent cue was active. In the present series of experiments, we investigate what features of negative patterning may contribute to imagery. Experiment 1 ruled out the potential contribution of reinforcement amount while Experiments 2 and 3 examined if a non-linear solution was necessary, or if task complexity was sufficient. Taken together, these results have interesting implications for representational processes engaged in problem solving.

12:40 Tiffany Galtress, Aaron Smith & Kimberly Kirkpatrick (Kansas State University)

DRL Intervention Effects on an Impulsive Choice Task

Rats were trained on an impulsive choice task during which they were required to choose between a fixed-interval (FI) 10-s schedule that yielded a 1-pellet reward and a FI 30-s schedule that resulted in a 2-pellet reward. Stable choice performance revealed large individual differences in choice behavior, with both molar and momentary maximizing of reward evident in the individual rats. The rats were then given intervention training to improve response efficiency and reward timing with a differential reinforcement of low-rate (DRL) task. Rats experienced a DRL 10-s schedule, a DRL 30-s schedule, or both alternating. The rats were then re-tested on the impulsive choice task. Post-DRL intervention, the rats produced more accurate timing of the choice intervals and exhibited increased overall molar maximizing of reward. The results will be discussed in terms of improving self-control in a rat pre-clinical model.

12:50 Andrew Marshall & Kimberly Kirkpatrick (Kansas State University)

Reward Magnitude Effects on Sequential Risky Choices in Rats

The goal of the present experiment was to determine the trial-by-trial effects in a sequential risky choice procedure. Twenty-four rats were trained to choose between a certain outcome that always delivered food and a risky outcome that probabilistically delivered food (p = .25, .33, .5, .67, .75). Certain-choice food delivery was either 2 or 4 pellets (p = .5). Risky-choice food delivery varied across groups (1 or 11, 2 or 11, 4 or 11). The probability of risky-food delivery and the risky-food magnitude both affected choices of the risky outcome. Simulations of sequential-choice models were also performed to evaluate the reward valuation processes involved in risky choices. The results emphasized the importance of studying the effects of global and local factors on choice behavior and suggested the inclusion of time- and trial-based components in future models.

1:00	Catherine Mingee (The University of Toledo) **The Effect of Hunger and Effort on Response Variability in Rats** Response variability may be influenced by multiple factors in the environment as well as an individual's previous experiences. This study was designed to investigate the effect of hunger drive and effortfulness of response on rats' response variability in a two-choice lever press situation. Rats were tested for a total of four weeks, Week 1 was considered to be between-groups and Weeks 1 – 4 were combined to test within-subjects data. Variability was measured in three different ways: the number of times the response location changed in a single session, the length of the first group of responses before changing response and the mean length of responses before changing response location. Between-groups data suggest neither hunger nor effort influence response variability in rats. Within-subjects data suggest hunger did not play a role in response variability, however, effort was significant. Variability of response increased when responding required less effort, as illustrated by all three measures of variability: Fchanges(1,14)=10.41, p<.05, d=2.27, Ffirstrun(1,14)=11.54, p<.005, d=1.82, Fmeanrunlength(1,14)=10.95, p<.005, d=1.77.
1:10	Damian Scarf & Michael Colombo (University of Otago) **Comparative Neuroscience: Reward Modulation in the Avian NCL** The literature on the neural basis of learning and memory is replete with studies using rats and monkeys, but hardly any using pigeons. The unwillingness to use pigeons in neural studies of learning and memory likely stems from two factors: 1) that the avian brain is seen as radically different from the mammalian brain and, 2) that the behavior of pigeons is not seen as sophisticated as that of mammals, and certainly primates. Studies over the past few decades detailing the remarkable cognitive abilities of pigeons, as well as a newly revised nomenclature for the avian brain, should spark a renewed interest in using pigeons as models to understand the neural basis of learning and memory. As an example, in this talk I will present data on reward modulation in the avian nidopallium caudolaterale (NCL).
1:20	**10 Minute Break**

Space and Time

Session Chair: Brett Gibson

1:30	Brett M Gibson (University of New Hampshire), Jonathan Atwood (University of New Hampshire), & Amanda Cavenaugh (University of New Hampshire) **Testing Pigeons with Traveling Problems in Small and Large Spaces** Previous work (Gibson, Wilkinson & Kelly, 2011) has suggested that pigeons might plan ahead when solving Traveling Salesperson Problems (TSPs) in a small room. The evidence for planning was more prominent for problems in which the nodes/locations of the TSP configuration were spaced farther apart compared to when they were closer together. Here we investigated the ability of pigeons to solve the same TSPs in both small and large spaces. The results suggest that traveling in the larger space did not consistently improve the efficiency of the routes selected by pigeons compared to the same tests given in the smaller space.
1:40	Kenneth J. Leising, Joshua Wolf, & Chad M. Ruprecht (Texas Christian University) **Higher Order Modulation of Spatial Relations in Pigeons and Humans** Discriminative stimuli may be structured in a hierarchical fashion, thus requiring knowledge of the relations between them to emit the rewarded response. In this task, we were interested in higher order modulation of operant responding that involves a spatial relation. Humans and pigeons were presented with a colored background display followed a few seconds later by a landmark (a patterned square) at one of eight linearly arranged response locations. The colored display modulated which response (in space) was rewarded. Transfer tests in both subjects revealed modulation by the colored display and transfer to other landmarks trained with a different display. We also report some differences between species on generalization tests with novel stimuli. The results will be discussed in terms of the importance of higher-order relationships in the spatial domain.
1:50	Debbie M. Kelly & James Reichert (University of Manitoba) **Effects of Experience on the Use of Geometric and Featural Cues by Clark's Nutcrackers (*Nucifraga columbiana*)** All mobile species must orient, yet we know surprisingly little about how this process is achieved. Orientation is the fundamental step required for navigation, as it allows the traveler to determine in which direction to begin heading. Only once one has successfully oriented can navigation begin. Classic studies have shown that the two types of cues used by animals to orient are features and geometry. Features are objects within an environment (e.g., trees or buildings), whereas geometry is the metric relationship between objects or surfaces (e.g., distances or directions). However, the mechanisms by which these spatial cues are integrated are not known. In the current study, we investigated the effect of experience on the weighting of featural and geometric cues during a spatial search task by a food-storing bird, the Clark's nutcracker. Four groups of birds were trained to locate food hidden at one corner of a fully-enclosed rectangular arena. Two groups were initially trained with features whereas two other groups were initially trained with geometry. Of the featurally trained groups, one was retrained with geometry. Likewise, of the geometrically trained groups, one was retrained with features. We found that unlike other avian species examined

	using similar procedures, nutcrackers showed a primary weighting of geometric information.
2:00	Matthew S. Matell, Loryn S. Hartshorne, Ashley L. Moore, Jung Kim & Teagan Bisbing (Villanova University) **A Single, Scalar, Temporal Expectation Results from an "Equal Value" 15-45s Variable-Interval Procedure** Previous work in our lab has demonstrated that rats trained that two different modality cues predict two different delays to reinforcement will generate a single scalar temporal expectation at the average of these durations when presented with the compound. We have recently found that this scalar temporal averaging only occurs when the reinforcement density of the two cues (i.e., reinforcement probability/delay) are similar. In the present work, we put this finding to a strong test by training rats using a variable-interval peak procedure, in which food would be probabilistically available at a variable time ranging from 15-45s. The ratio of reinforced trials to non-reinforced probe trials increased as a function of the delay (from 1:3 to 3:1), such that every duration had an equal reinforcement density. Remarkably, the response rate on non-reinforced probe trials peaked in a scalar manner at 32s, suggesting that the rats were integrating the 31 different outcomes to generate a single temporal expectation of reinforcement. In contrast, rats trained with equivalent reinforced to probe trial ratios (all durations were 1:1), produced a broader, non-scalar expectation.
2:10	Lucia F. Jacobs (University of California, Berkeley) **How Cognitive Functions Converge: the Case of the Cognitive Map** A great evolutionary conundrum is how convergent cognitive functions emerge from divergent developmental and evolutionary pathways. One example is the ability to extrapolate a novel orientation vector across untravelled space - i.e., the cognitive map. Despite the independent evolution of the brain in metazoans such as vertebrates and arthropods, the cognitive tools by which they encode spatiotemporal variations in resources across space are remarkably convergent. Patterns of spatial encoding that differ among species and sexes across diverse taxa suggest that they use the same mechanism for cognitive mapping, specifically the use of a parallel map structure (Jacobs & Schenk, 2003), despite the divergence in neural structure from their common ancestor. Here I present a new hypothesis about the developmental and evolutionary pathway that led to this convergent solution and how this could have been derived from homologous gene networks found in their Precambrian common ancestor.
2:20	**10 Minute Break**

Pattern Learning & Data Mining

Session Chair: Stephen Fountain

2:30	Robert R. Hampton, Regina Paxton & Victoria L. Templer (Emory University) **Mental Representations of Order in Rhesus Monkeys** Monkeys demonstrate the representation of order in memory for the order of unique events, memory for habitually executed simultaneous chains, and performance in transitive inference tests. Performances in all three of these tests yield symbolic distance effects, such that items that are widely separated according to the underlying order are easier to discriminate that items that are less separated. We have begun to test the extent to which the symbolic distance effect is indicative of a common underlying representational code. One promising candidate is a spatial code, which has properties that would produce symbolic distance effects, would allow "linking" of ordered lists, and would support the "logical inferences" of transitivity. A spatial code might also account for the findings, where appropriate tests have been done, of a critical role for the hippocampus in performing these tasks.
2:40	Olga Lazareva, Kaitlyn Kandray (Drake University), Regina Paxton, Robert R. Hampton (Emory University) **Do Reinforcement-Based Models of Transitive Inference Accurately Describe Primate Data?** In a transitive inference (TI) task, animals are presented with 4 stimulus pairs (A+ B-, B+ C-, C+ D-, and D+ E-). Later, stimuli B and D are given together, and the choice of B is interpreted as an indication of TI. The ability of reinforcement-based models to predict TI behavior after such training has been extensively documented. However, most of the research on models of TI has relied on data from pigeons. Pigeons are trained sequentially (first A+ B-, then B+ C-, etc.); the number of stimuli is limited to 5; and, the correction trials are used during training. In contrast, primates can be trained with 7 stimuli (A to G) introduced simultaneously with no correction trials. Would the models still accurately account for these data? We will present the results of simulations with two configural models of TI (Wynne, 1995; Siemann & Delius, 1998) used to predict transitive choices of rhesus monkeys after successive and simultaneous training in 7-item series task, as well as after list linking procedure.
2:50	James D. Rowan, Aditi Dey, Crystal Osburn, Turhonda Williams, Sonija Bastola, Daniella Jones, & Sonali Poudel (Wesleyan College) **The Dracula Effect: Failure to See the Effects of a Violation in the Mirror Rule in Rat and Human Serial Pattern Learning** Rats and humans, in an analogous procedure, were assigned to one of 4 groups. All patterns were structured so that the highest order transition was a "Mirror Rule" (1st half of the pattern in the opposite order). Group 1 learned 3-Level Nested Pattern, Group 2 received a violation in the 1st half, Group 3 received a violation in the 2nd half, and Group 4 a violation in both halves. Group 1 replicated earlier findings supporting nesting. Groups 2-4 showed the effects of the violation were limited to the half of the pattern on which they occurred. No elevation was seen in the opposite side of the mirror rule (the Dracula Effect).

3:00	Karen E. Doyle, Samantha M. Renaud, Carissa Martin (Kent State University), Dennis Garlick, Aaron P. Blaisdell (UCLA), & Stephen B. Fountain (Kent State University) **Serial Pattern Acquisition in a Touchscreen Task for Rats** In developing a task for comparing serial learning in rats and pigeons, we chose a touchscreen task analogous to another task in which rats learn pattern elements at rates predicted by pattern hierarchical structure. Analogous results are not obtained consistently in the touchscreen task. In this study, we examined different reinforcement procedures that affect element acquisition rates. Reinforcement was delivered either after each correct response to the individual elements of the pattern or after the last correct response of each 3-element chunk. These manipulations produced dramatically different patterns of element acquisition in rats, but rats' and pigeons' results were comparable. Differential working memory load may explain differences in element acquisition in the touchscreen task.
3:10	Kimberly Kirkpatrick (Kansas State University) **Adventures in Data Mining** The ability to collect large amounts of raw data has grown enormously in the past two decades, opening the door to rich opportunities for exploratory data analysis. However, there are considerable challenges in analyzing large data sets that can inhibit researchers from engaging in data mining. The present talk will discuss some of the advantages and challenges associated with data mining. An approach embedded in the fundamentals of hypothesis testing coupled with measurement development will be described. Approaches to developing tools that can aid researchers in analyzing large data sets will be discussed. The development of robust tools should lead to effective implementation of data mining techniques by researchers with a wide variety of backgrounds. The discussion of approaches to data mining will hopefully encourage the archiving and sharing of large data sets and associated tools for exploratory data analysis.
3:20	**10 Minute Break**

Keynote Address
Onur Güntürkün (Ruhr-Universität Bochum)
Introduced by Olga Lazareva

3:30 -4:30	**Cognition without Cortex: The Convergent Evolution of Avian and Mammalian Forebrains** In neuroscience, we grew up assuming that higher cognitive operations depend on the cortex. But is that true? There are ways of testing this, since vertebrates like birds have no cortex. Birds represent an equally successful vertebrate class and a vast literature on avian cognitive skills testifies that birds are able to generate the same set of cognitive operations as mammals. Especially corvids reach similar levels of performance as apes in cognitive experiments. However, birds and mammals differ substantially with regard to the organization of their forebrains with birds lacking a cortex-like lamination. I will argue that: 1) lamination is no prerequisite for higher cognitive processes (“at the macro-level, function goes before form”); 2) advances in cognitive operations in mammals and birds go along with an allometric increase of associative and striatal volumes (“cognitive evolution usually operates at the neural quantity level”); 3) connectional patterns are equal between birds and mammals (“different brain organizations do not prevent equal connectivity”), 4) despite vastly different forebrain organizations, both mammals and birds convergently developed a ‘prefrontal’ area for their executive functions (“at the micro-level, degrees of freedom to create different neural architectures for specific functions are very small”).

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 and 2009 (Fall conference held 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 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

To join CCS, please complete the following form and mail along with a check to:

Dr. Olga Lazareva
Secretary, Comparative Cognition Society
316 Olin Hall
Department of Psychology
Drake University
Des Moines IA 50311

Name: ____

Email Address: ____

Institutional Affiliation: ____________________________________

Status: Faculty Graduate Student Post-doc Other:____________

2012 Annual Dues: Faculty - $50 Student/Post-doc - $20

You can also become a member and pay your dues by visiting our website: www.comparativecognition.org