∫QAB

Society for the Quantitative Analyses of Behavior

Chicago

37th Annual Meeting, May 22 - May 24, 2014

McCormick Place Convention Center (Chicago, Illinois)

The Society for the Quantitative Analyses of Behavior (SQAB) was founded in 1978 by M. L. Commons and J. A. Nevin to present symposia and publish material which bring a quantitative analysis to bear on the understanding of behavior. This International Society holds its annual meeting in conjunction with the Association for Behavior Analysis International (ABAI). Talks at SQAB focus on the development and use of mathematical formulations to: characterize one or more dimensions of an obtained data set, derive predictions to be compared with data, and generate novel data analyses.
You can retrieve more information about SQAB at our website: www.sqab.org

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Richard J. Herrnstein

Welcome to SQAB 2014

Thursday Evening, May 22 – Room W471A
1st Poster Session*, Cash Bar & Registration* (5:00-8:00 pm)

(Poster abstracts begin on page 12)

Friday, May Friday, May 23 – Room W470AB

7:00-8:30 am	Registration, Coffee & Pastries
8:30 am	President's Introduction Timothy Shahan *Utah State University (USA)*

Quantitative Analysis of Behavior

8:45-9:20 am Pragmatism, Models, and the Ideal of Prediction and Control

Jay Moore
University of Wisconsin-Milwaukee (USA)

Mathematical models are often held to be valuable, if not necessary, for theories and explanations in the quantitative analysis of behavior. The present review suggests that models primarily derived from the observation of functional relations may indeed contribute to the scientific value of theories and explanations, even though the final form of the models appears to be highly abstract. However, models not primarily so derived invite less effective and frequently mentalistic theories and explanations of behavior. Models may be evaluated in terms of both (a) the verbal processes responsible for their origin and development and (b) the prediction and control engendered by the theories and explanations that incorporate the models, however indirect that prediction and control may be. Overall, technological application and theoretical contemplation may be most usefully seen as continuous forms of scientific activity, rather than dichotomous.

9:20-9:55 am A Philosophy of Science Perspective on the Quantitative Analysis of Behavior

Terry Smith
Edinboro University of Pennsylvania (USA)

The philosophy of science poses three major criticisms of the science of behavior analysis: (1) that operant explanations are tautologous, (2) that operant explanations, when valid, are actually mentalistic explanations in a specialized vocabulary, and (3) that the scope of operant regularities is limited. The first two objections are based upon misunderstandings of behavior analysis. The process of clearing away these misunderstandings reveals that behavior analysis must always be (in a broad sense) a 'quantitative' analysis of behavior and that such a quantitative analysis makes no reference to mental states or processes. These clarifications have implications regarding the type of explanation that can be delivered by behavior analysis. Turning to the third objection, it seems that all psychological theories struggle to provide instances of what William Whewell (1794-1866) called "consilience." The presentation ends with an assessment of behavior analytic progress in this area.

9:55-10:30 am The Role of Induction in Applying Matching Theory to Schedule Performance

William Baum
University of California Davis (USA)

The matching law, which originally stated that relative responding between two alternatives matches (equals) relative reinforcers obtained between them, was extended also to n alternatives, including one (measured) alternative. Herrnstein (1970) fitted a hyperbola to single-key responding and, in doing so, assumed that the reinforcers for other (unmeasured) activities (RO) remained constant. Constancy of RO is inconsistent theoretically with other concepts used to understand operant activities. It should vary with the other activities (BO) on which it depends. Using a view of induction I proposed recently (Baum, 2012), I amend the hyperbola to include activities induced by a contingent phylogenetically important event (PIE) such as food and show how a quantitative account of induction explains a complicated set of results (Baum, 1993) relatively simply in comparison with the sorts of approaches taken in the past.

10:30-10:55 am Break - Refreshments

10:55-11:30 am Reinforcement Learning Models of Conditioning
Elliot Ludvig
University of Warwick (UK)

In this talk, I suggest that the formalisms of reinforcement learning (RL) are a natural extension of animal learning theory that offer a rich theoretical framework for building future quantitative models of behavior. RL is a branch of artificial intelligence that aims to create interactive agents that learn to optimize rewards in their environments. RL algorithms, such as TD learning, are simple and incremental, making them particularly suitable as computational models of conditioning. In addition, they are normatively grounded, allowing for clear theories of what is being computed, and are often backed by theoretical guarantees about their functionality. I present example RL models that provide simple computational accounts for several vexing conditioning phenomena, including response timing, retrospective revaluation, suboptimal choice, and timescale invariance. I end with some speculations about areas of RL research that might be best exploited for future models of learning and choice.

11:30-12:05 Mathematics and Verbal Behavior
M. Jackson Marr
Georgia Tech (USA)

"Behavior which is effective only through the mediation of other persons has so many distinguishing dynamic and topographical properties that a special treatment is justified and indeed demanded" (Skinner, 1957, p. 2). Skinner's demand for a special treatment of verbal behavior can be extended within that field to domains such as music, poetry, drama, and the topic of this presentation: mathematics. For centuries, mathematics has been of special concern to philosophers who have continually argued to the present day about what some deem its "special nature." Two interrelated principal questions have been: (1) Are the subjects of mathematical interest pre-existing in some transcendental realm and thus are "discovered" as one might discover a new planet; and (2) Why is mathematics so effective in the practices of science and engineering even though originally such mathematics was "pure" with applications neither contemplated or even desired? I argue that considering the actual practice of mathematics in its history and in the context of acquired verbal behavior one can address at least some of its apparent mysteries. To this end, I discuss some of the structural and functional features of mathematics including verbal operants, rule-and contingency-modulated behavior, relational frames, the shaping of abstraction, and the development of intuition. How is it possible to understand Nature by properly talking about it? Essentially, it is because Nature taught us how to talk.

12:05-1:45 pm Lunch

The SQAB Executive Committee will meet during lunch

1:45-2:20 pm Delay Discounting as a Process
Amy L. Odum, Jonathan E. Friedel, & William B. DeHart
Utah State University (USA)

Delay discounting is defined as the decrease in the value of a reward with delay to its receipt. There are a number of well-accepted procedures to measure delay discounting. But what is it, really? We will explore delay discounting at a variety of levels. At one level, Bickel and colleagues have argued that delay discounting is a trans-disease process. That is, multiple human maladies are associated with steep discounting of delayed rewards. We have argued that delay discounting may also be a personality trait. That is, steep delay discounting reflects an enduring pattern of choices that an individual makes across time and a variety of situations. Importantly, delay discounting is predictive of important health outcomes. Delay discounting is also sensitive to environmental and situational influences. Interventions show promise to decrease delay discounting to therapeutic benefit.

2:20-2:55 pm Modeling Impairment: Quantitative Analysis and Environmental Contaminants
Christopher M. Newland
Auburn University (USA)

How does exposure to low, environmental levels of contaminants affect behavior? Mathematically motivated behavioral models facilitate the identification of subtle behavioral effects that can be applied to understand the impact of chemical exposure. By unravelling behavior into interpretable parameters, these models can also help link behavioral effects to their neural correlates. We have used several such models to understand the consequences of exposure to drugs and neurotoxicants. In one example, a strictly empirical model of the acquisition of choice built upon the matching law showed that gestational exposure to lead or to methylmercury retarded the acquisition of choice but not its expression in steady state. It did so by disrupting the impact of reinforcing events and, in fact, methylmercury appears to act by enhancing the impact of reinforcers and consequently making behavior change more difficult. In a second example, the partitioning of the response stream into bouts using log-survival analyses has led to the dissection of behavior into components that are selectively sensitive to motivational influences and motor deficits. We have used log-survivor analyses of interresponse times to examine the impact of methylmercury exposure as well as behaviorally active drugs. A model that provides independent and understandable parameters that refer to specific behavioral characteristics can have important uses.

2:55-3:15 pm Break-Refreshments

3:15 pm Generalized Essential Value Based on Exponential Demand
Steven R. Hursh,
Institutes for Behavior Resources, Inc., Baltimore, Maryland (USA)

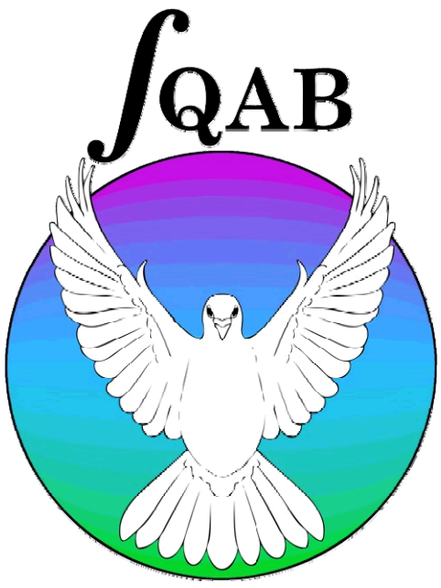
A basic exponential function appears to adequately describe most demand curves when plotting the log of consumption as a function of cost (Hursh & Silberberg, 2008). The rate constant of the exponential, α, determines the rate of decline in relative consumption (log consumption) with increases in cost (C). The value of k is a scaling constant that reflects the range of the data and is generally set to a common constant across comparisons. The slope of the demand curve, elasticity, when k is constant is determined by the rate constant, α. The value of α determines the sensitivity of consumption to changes in cost. Sensitivity to price (α) is inversely proportional to essential value (EV). In order for EV to be a valid metric of value across experiments, the formulation must consider the value of k that establishes the span of the consumption data in the experiment. In this paper, we introduce a novel way to calculate EV such that it is relatively independent of the value of k used to fit the data. This definition of value may be used to scale essential value for different reinforcers across a range of experiments and is closely related to the price at which demand elasticity is -1 and overall responding is maximal, the price point called Pmax.

3:50-4:25 pm Using Quantitative Models of Impulsive Behavior to Inform Neurobehavioral Research
Suzanne H. Mitchell
Oregon Health & Science University (USA)

Data from children diagnosed with ADHD and other, undiagnosed, children will be used to compare several different quantitative models of delay discounting (hyperbolic, exponential, hyperboloid and quasi-hyperbolic, as well as AUC formulations) and their stability over 2 years. The parameters of the models will be compared and, in conjunction with other demographic and cognitive functioning measures, used to shed light on the processes that underlying group differences in the parameters. The relationship between basal, resting state neural activation and model parameters in this population will be discussed, as well as the relationship between neural activity in different regions during a delay discounting task and delay discounting parameters assessed outside the scanner. The quantitative models can also be fit to data from rodent studies, and differences in the parameters and their behavior between human and rodent studies will be briefly described.

5:00 pm Business Meeting – All SQAB members are welcome (Room W470AB)

6:30-9:00 pm 2nd Poster Session & Cash Bar, Room W471A (6:30-9:00 pm)



8:30-9:05 am Neural Network Simulations of Autoshaped Choice

José E. Burgos
University of Guadalajara (Mexico)

I used an existing neural network model to simulate autoshaped choice, where animals allocate responding to a cue previously paired more frequently with food, independently of their behavior. The model hypothesizes roles for hippocampal and dopaminergic systems in, but makes no distinction between, Pavlovian and instrumental learning qua connection-weight change. A neural network was designed with inputs to simulate two cues and an input to simulate an appetitive stimulus (S*). Each input was connected separately to different hidden units, and these to outputs that were not activated by S*, to simulate different non-exclusive emitted responses. This network simulated autoshaped choice for different S* frequencies, cue and S* magnitudes, and S* delays. These results suggest that emitted-response biases acquired through Pavlovian contingencies could precede economic decisions. Such biases could also have an underlying learning mechanism common to biases acquired through instrumental contingencies.

9:05-9:40 am Contiguity and Shaping View of Reinforcement: The Copyist Model

Takayuki Tanno, Alan Silberberg & Takayuki Sakagami
Kwansei Gakuin University (Japan)

The copyist model simulates single- and concurrent-schedule operant effects. Its algorithm posits that animals remember an interresponse-time (IRT) for all responses between each of the 300 most recent successive reinforcers. This value is weighted so that IRTs closer to reinforcement contribute more to its definition. The likelihood of selection of an IRT for emission is weighted so each IRT in memory occupies the same portion of session time. For this algorithm, inputs to memory are based on contiguity principles. Responses are based on the IRT values in memory. Since the value of each IRT is based on the latency of each response and the reinforcers it produces, IRTs are "shaped" by the schedule. In its strongest form, this view explains behavior without appeal to operant views of the behavior stream as measuring reinforcer value or strength. Instead, behavior is due to response-reinforcer contiguity and the IRTs these contiguities select.

9:40-10:00 am Break - Refreshments

10:00-10:35 am Predictions of an Evolutionary Theory of Behavior Dynamics
Jack J. McDowell
Emory University (USA)

An evolutionary theory of behavior dynamics implements the idea that behavior is selected by its consequences. This is accomplished computationally by a genetic algorithm that operates on a population of potential behaviors. The simple selectionist rules of the genetic algorithm animate an artificial organism that behaves continuously in time. The theory was developed in the context of single alternative responding and was initially required to produce a hyperbolic relationship between response and reinforcement rates. Without further development or modification, the theory was then found to accurately describe a wide range of equilibrium and dynamic phenomena beyond the single alternative case. For example, the theory generates behavioral equilibria on concurrent schedules that are consistent with the algebraic forms of all the empirically valid equations of matching theory, exactly and without residual error. The theory also makes a priori predictions about behavior on concurrent schedules for which empirical evidence does not yet exist. Most importantly, the theory predicts that every assumption entailed by any version of matching theory is false. If fully verified by experiment, this means that the idea implemented algebraically by matching theory, namely, that all behavior is choice governed by the matching law, cannot be true. It follows that the empirically accurate algebraic forms of the matching-theory equations must arise from some other process, such as evolutionary dynamics.

10:35-11:10 am Behavioral Contrast: Action at a Distance or Dark Matter?
Peter Killeen
Arizona State University (USA)

A mechanist theory of behavioral contrast is offered. Responses, supported by the same reinforcers that maintain target instrumental responses, compete with the target responses. In addition, competing responses may spill over from the prior component, causing initial contrast, or may be modulated by conditioned reinforcement or punishment from stimuli associated with component change, causing terminal contrast. A formalization of this hypothesis based on the dynamic Mathematical Principles of Reinforcement (Killeen & Bizo, 1998) has some success in describing local/dimensional contrast, the following schedule effect, undermatching, and the component duration effect.

11:10 am Joseph V. Brady Impactful Research Award
Presented by Gregory Madden
Utah State University (USA)

11:15 am Closing Remarks
Timothy Shahan
Utah State University (USA)

SQAB Preeminent Tutorials will be held in Room W178A McCormick Place Convention Center as part of the annual meeting of the Association for Behavior Analysis International

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1:00-1:50 pm **Claudia Drossel**
University of Michigan
SQAB Tutorial: Behavior Analysis: Translation of Principles and Clinical Applications in General Practice

Chairperson: Patrick Friman, Boys Town Center for Behavioral Health

Early experimentalists, such as Azrin, Ferster, Sidman and many more, had a vision of exporting laboratory-derived operant principles to clinical practice settings. Systematically exploring the possibilities inherent in behavior analytic assessments and interventions, these pioneers and their students markedly raised the standards of care, most notably in areas limited to mere custodial or restraint-based services at the time, where progress had been deemed beyond clinicians' reach. Fast forward to more than half a century later: What do consumers in general clinical practice settings need today? How are the advances in the experimental analysis of behavior used to meet our most pressing public health concerns? This tutorial will link current public health issues with advances in the operant analysis of behavior. It will illustrate how an experimental approach to clinical questions, assessments, and interventions is relevant and timely in today's healthcare environment, both as a problem-solving tool and a source of clinical innovation.

2:00-2:50 pm **Daniel Gottlieb**
Sweet Briar College
SQAB Tutorial: Bringing Pavlov's Science to Behavior Analysis II

Chairperson: Patrick Friman, Boys Town Center for Behavioral Health

Last year, I talked about the breadth of Pavlovian processes before discussing the different types of Pavlovian stimuli and how they might not all be equally amenable to intervention. This year, my focus is on how Pavlovian processes may be a driving force in a number of areas in which people are failing to properly regulate, leading to such problems as obesity, drug addiction, immune system dysfunction, and disorders of attention. These problems are likely the result of exposure to stimuli that were not present in the environment in which modern humans evolved. Because a characteristic of Pavlovian learning is an indifference to instrumental contingencies, dysfunction relating to Pavlovian conditioning is likely going to be ill-served by current behavior analytic methods. Although it is not clear how to treat most dysfunctions driven by Pavlovian processes, recent advancements from basic research provide powerful new methodological and conceptual tools of which few outside the field are aware. General options for moving forward will be discussed in light of these recent advancements.

3:00-3:50 pm **John Staddon**
Duke University
SQAB Tutorial: Willie Sutton – or Where the Real Reinforcers Are

Chairperson: Patrick Friman, Boys Town Center for Behavioral Health

This tutorial is an exploration of the reinforcement contingencies set up by the financial industry with instruments suchas credit default swaps and other insurance-like products. The question a behavior analysis must ask is what are the implications of these instruments for economic stability and the functionality of the allegedly optimizing, but invisible, hand of Adam Smith. Once again, globally-destructive behavior can best be explained in terms of a contrast between short-term and long-term consequences. It should come as no surprise that given the option, the financial industry pursues short-term gains and long-term losses and focused benefits with dispersed losses.

4:00-4:50 pm **Anna Kukekova**
Department of Animal Sciences, University of Illinois at Urbana-Champaign
SQAB Tutorial: The Fox Domestication Project and the Genetics of Social Behavior

Chairperson: John Staddon, Duke University

Domestication as a special form of evolution offers valuable insights into how genomic variation contributes to complex differences in behavioral and morphological phenotypes. The genetics-centered view of the domestication is supported by experimental selection of farm-bred foxes (*Vulpes vulpes*) that begun at the Russian Institute of Cytology and Genetics in the 1950s. Selection of foxes for either tame or aggressive behavior, has yielded two strains with markedly different, genetically determined behavioral phenotypes. Tame-strain foxes communicate with humans in a positive manner and are eager to establish human contact. Foxes from the aggressive strain are aggressive to humans and difficult to handle. Although the foxes were selected solely for behavior, changes in physiology, morphology, and appearance with significant parallels to characteristics of the domestic dog, were observed in tame-strain foxes. These two fox strains provide a rich resource for investigating the genetics of complex social behaviors. Although the focus of our work is on the genetics of domestication in the silver fox, there is a broader context. In particular, one expectation of the silver fox research is that it will be synergistic with studies in other species, including humans, to yield a more comprehensive understanding of the molecular mechanisms and evolution of a wider range of social interactive behaviors.

May 22nd Thursday evening session from 5-8 pm. The session will be held in Room W471A, McCormick Place Convention Center (Chicago, Illinois).

1. Loss of Alternative Non-Drug Reinforcement Produces Resurgence of Cocaine Seeking in Non-Food-Restricted Rats
Rusty W. Nall, Andrew R. Craig & Timothy A. Shahan
Utah State University (USA)

2. Probability Estimation of Alcohol Related Positive and Negative Outcomes in Mexican College Students
Melisa Chavez & Bouzas Arturo
Universidad Nacional Autónoma de México (MX)

3. Contribution of the Nucleus Accumbens Core and Lateral Orbitofrontal Cortex to Delay and Reward Magnitude Sensitivity
Travis Moschak & Suzanne Mitchell
Oregon Health Science University (USA)

4. Effects of Varying the Spatial Position of the Signaling and Water on the Differential Adjustment
Felipe Patrón, Carlos Torres & Carlos Flores
Universidad de Guadalajara (MX)

5. Conditioned Reinforcement and Informativeness Reconsidered
Paul Cunningham[1], Paulo Soares Filho[2], Andrew R. Craig[1] & Timothy A. Shahan[1]
[1]Utah State University (USA) & [2]University of Sao Paulo (MX)

6. Altruism and Reciprocation in the Prisoner's Dilemma Game
Vasiliy Safin, Kodi B. Arfer & Howard Rachlin
Stony Brook University (USA)

7. Categorizing Patterns of Acquisition in a Pigeon Slot Machine Analog Using Polynomial Regression
Nathaniel Rice, Alexander Ward & Elizabeth G. E. Kyonka
West Virginia University (USA)

8. Framing Alters Demand for Indoor Tanning on a Hypothetical Purchase Task
Brent A. Kaplan[1], Amel Becirevic[1], Derek D. Reed[1], Peter G. Roma[2] & Steven R. Hursh[2]
[1]University of Kansas (USA) & [2]Institutes for Behavior Resources Inc. and Johns Hopkins University School of Medicine (USA)

9. America's Sweet Tooth for Soda: A Behavioral Economic Analysis of Sugar-Sweetened Beverage Consumption
Amel Becirevic, Andrea B. Phillips, Brent A. Kaplan & Derek D. Reed
University of Kansas (USA)

10. Are the Impulsive Persistent? Investigating the Relation Between Delay Discounting and Behavioral Momentum Performance
Charles Frye, Andrew Craig, Jonathan Friedel & Amy Odum
Utah State University (USA)

11. Some Behavioral Effects of Mefloquine: Evaluation of $GABA_A$ and $GABA_B$ Antagonists in Rats
Lauren Krowitz & Rodney D. Clark
Allegheny College (USA)

12. Choice Without the Last Reinforced Alternative
Joshua Bensemann, Douglas Elliffe, Brenda Lobb & Christopher A. Podlesnik
The University of Auckland (New Zealand)

13. The Role of Lever Location on Both Response Rates and Banking in Rats Responding on Ratio Schedules of Reinforcement
Eric J. French & Mark P. Reilly
Central Michigan University (USA)

14. Discounting of Delayed and Probabilistic Rewards in Marijuana Users, Cocaine Users, and Controls
Diana Mejía[1], Silvia Morales[1], Leonard Green[2] Joel Myerson[2] & Javier Nieto[1]
[1] Universidad Nacional Autónoma de México (MX) & [2]Washington University in St. Louis (USA)

15. The Content of Temporal Discrimination Learning
Carlos Pinto & Armando Machado
University of Minho (Portugal)

16. Behavioral Mechanisms Underlying Reinforced Behavioral Variability
Ann Galizio & Adam H. Doughty
College of Charleston (USA)

17. Searching for Relational Responding in a Temporal Bisection Task
Marilia Pinheiro de Carvalho[1], Armando Machado[1] & François Tonneau[2]
[1]University of Minho (Portugal) & [2]Federal University of Pará (Brazil)

18. Preliminary Validation of Cloning Reproduction with a Novel Method of Selection in the McDowell Evolutionary Theory of Behavior
Nicholas Calvin & Jack McDowell
Emory University (USA)

19. Accuracy of Maze Learning in Crayfish when Exposed to an Errorless Learning Procedure
Mary Rachel Enoch, Kelti Owens & Mark R. Dixon
Southern Illinois University (USA)

20. Sensitivity to Delay of Reinforcement in an Animal Model of ADHD
Maricruz Vargasa, Mariana Gaytana & Vladimir Orduñaa
Universidad Nacional Autónoma de México (MX)

21. Matching in Context: The Choice Altering Effects of Function Altering Stimuli
Kenneth W. Jacobs & Linda J. Parrott Hayes
University of Nevada Reno (USA)

22. Expected Delay Accounts for Choice Involving Repeated Gambles
Ariana Vanderveldt[1], Leonard Green[1] & Howard Rachlin[2]
[1]Washington University in St. Louis (USA) & [2]Stony Brook University (USA)

23. Change-Point Analysis of Single-Session Spatial Discrimination Reversals: Effects of *d*-Amphetamine on Within-Session Acquisition.
Craig W. Cummings, Blake A. Hutsell & M. Christopher Newland.
Auburn University (USA)

24. The Initial Conditions of Directional Turning in Children and Teenagers
Pablo Covarrubias & Ofelia Citlalli López-Jiménez
Centro de Investigación en Conducta y Cognición Comparada, Universidad de Guadalajara-CUCI

25. Nicotine-Induced Conditioned Place Preference and Locomotor Activity in an Adolescent Model of Attention-Deficit Hyperactivity Disorder (ADHD)
Elizabeth Watterson, Carter W. Daniels, Gabriel Mazur, Lucas R. Watterson & Federico Sanabria
Arizona State University (USA)

26. An Analysis of Variability in the Time-Left Procedure
R. Emmanuel Trujano & Vladimir Orduña
Universidad Nacional Autónoma de México (MX)

27. Effects of High-Fat Diet on Demand and Essential Value of Food in a Closed Economy
Stephen H. Robertson[1], Steven R. Boomhower[2] & Erin B. Rasmussen[1]
[1]Idaho State University (USA) & [2]Auburn University (USA)

28. Dynamics of Responding on a Balloon Analog Task
Mandy Small, Rob Ross, Muchen Zhu, Sinenuch Wongsomboon & Elias Robles
Arizona State University (USA)

29. A Test of Weber's Law with Dogs
Jessica Cliff, Surrey M. K. Jackson, James S. McEwan & Lewis A. Bizo
University of Waikato (New Zealand)

30. Token-Production Schedule Performances are Loyal to the Mathematical Principles of Reinforcement
Travis Smith & Eric Jacobs
Southern Illinois University Carbondale (USA)

31. The Microstructure of Steady-State Fixed-Interval Performance in Pacemaker-Accumulator Models of Timing
Carter W. Daniels & Federico Sanabria
Arizona State University (USA)

32. Comparing Response Proportion and Rate as Measures of Arousal in a Pigeon Model of Slot-Machine Play
Alexander Ward, Nathan Rice & Elizabeth Kyonka
West Virginia University (USA)

33. Temporal Discounting in a Variable Environment: Genetic Background, Signaled Reinforcer Ratios, and d-Amphetamine
Derek Pope[1], Blake Hutsell[2] & M. Christopher Newland[1]
[1]Auburn University (USA) & [2]Virginia Commonwealth University (USA)

34. A Generalized Matching Law (GML) Analysis of Cocaine vs. Food Choice in Rhesus Monkeys: Effects of Candidate Agonist Medications on Sensitivity to Reinforcement
Blake A. Hutsell[1], Matthew L. Banks[2], Bruce E. Blough & S. Stevens Negus
[1]Virginia Commonwealth University (USA) & [2]RTI International

35. Mechanisms of Impulsive Choice: Reward Sensitivity and Devaluation
Andrew Marshall & Kimberly Kirkpatrick
Kansas State University (USA)

36. The Effects of the Framing of Time on Delay Discounting
Brady DeHart, Hamilton Mendenhall, Justin Stonecipher & Amy Odum
Utah State University (USA)

37. Subjective Length of Prospective Time Negatively Correlates with Subjective Value of Delayed Reward
Yuki Kurata & Kenjiro Aoyama
Doshisha University (Japan)

End of First Poster Session

May 23rd Friday evening session from 6-9 pm. The session will be held in Room W471A, McCormick Place Convention Center (Chicago, Illinois).

1. Behavior Analytic Tests in Simulated Sports: An Application of the Generalized Matching Law
Merritt J. Schenk, Steven D. Bauer, Scott C. Collier, Mark Rinehart & Derek D. Reed
University of Kansas (USA)

2. Stimulus Preference and Reinforcement Effects of the Madagascar Hissing Cockroach (*Gromphordahina Portentosa*): A Case of Backwards Translational Research
Jacob H. Daar, Ashley M. Shayter, Matthew L. Johnson, Anna Cronin, Mark R. Dixon
Southern Illinois University (USA)

3. A Novel Approach to Residual Analysis in a Multiple Subject Design
Bryan Klapes, Nick Calvin & Jack J McDowell
Emory University (USA)

4. The Energetic State Contributes to the Value of Alternatives in a Choice Task: One More Contribution
Zirahuen Gonzalez-Vilchez & Oscar Garcia-Leal
Universidad de Guadalajara (MX)

5. Generalization Gradients Following Interdimensional Training: On the Acquisition of Temporal Control
Catarina Vieira de Castro, Marco Vasconcelos & Armando Machado
University of Minho (Portugal)

6. Paradoxical Choice: When Pigeons Prefer Fewer to More Reward
Ines Fortes, Marco Vasconcelos & Armando Machado
University of Minho (Portugal)

7. A New Model for Delay Discounting
Darren R. Christensen[1], Warren K. Bickel[2] & Christine E. Sheffer[3]
[1]University of Lethbridge (Canada), [2]Virginia Tech Carilion Research Institute (USA) & [3]New York City College (USA)

8. Coordination Patterns: The Cornerstone for the Cooperation
Alejandro Segura & Arturo Bouzas
Universidad Nacional Autónoma de México (MX)

9. The Magnitude Effect in Temporal Discounting: Replication of a Procedure
Nataly Yáñez & Vladimir Orduña
Universidad Nacional Autónoma de México (MX)

11. Are Choice Ratios Biased Toward the Location of the Last Reinforcer?
Ludmila Miranda-Dukoski, Michael Davison &Douglas Elliffe
The University of Auckland (New Zealand)

12. Discounting of Conditioned Reinforcers Paired Through Backward Conditioning
Arthur Prevel, Vinca Riviere & Jean-Claude Darcheville
Laboratoire Ureca, UFR de Psychologie, Université Lille Nord de France

13. Assessing Restricted Stimulus Control in Typically Developing Preschool Children and Bees (*Melipona quadrifasciata*)
Antonio Mauricio Moreno, Andre Augusto Borges Varella,Daniela de Souza Canovas, Lidia Maria Marson Postalli, Dora Fix Ventura & Deisy de Souza
Universidade Federal de São Carlos (Brazil)

14. Variability and Resistance to Change
Vinca Rivière & Mike Perfillon
Université Lille 3 (France)

15. Acquisition with Delayed Reinforcement: Obese Zucker Rats Learn Quicker than Lean Zucker Rats
J. Kai Simmons, David P. Jarmolowicz, Stephen C. Fowler, Mary Ritch & Jennifer L. Hudnall
University of Kansas (USA)

16. Decent Discounting Data Online: Assessing Climate Change Concern, Propensity for Sustainable Behaviour, and Temporal, Probability and Social Discounting using SurveyMonkey
Stephen Provost & Madelaine Begg
Southern Cross University (Aus)

17. B. D. Behavioral Research Website: Sharing and Discounting Overview
Darlene Crone-Todd & Barrie Todd
Salem State University & B. D. Behavioral Research (USA)

18. An Exploration of the Relationship Between Timing, Altruism, Competitiveness, Impulsivity, and Self-Control
Darlene Crone-Todd[1], Gabriela Esteves Lopes[2], James LaConte[1]
[1]Salem State University (USA) & [2]Universidade Federal de São Carlos (Brazil)

19. Value of Reinforcement in FI Schedules, Two Procedures: Delay and Magnitude
Jonathan Buriticá & Cristiano Valerio dos Santos
Universidad de Guadalajara (MX)

20. Human and Pigeon Timing in a Fixed-Interval Free-Operant Psychophysical Choice Procedure
Adam E. Fox[1], Katelyn E. Prue[1] & Elizabeth G. E. Kyonka[2]
[1]St. Lawrence University (USA) & [2]West Virginia University (USA)

21. Pigeons' Temporal Discrimination is Equivalent in Peak and Free-Operant Psychophysical Procedures
Shrinidhi Subramaniam & Elizabeth G. E. Kyonka
West Virginia University (USA)

22. Gamification as Behavioral Analysis: An Application to Two College Courses
J. Mark Cleaveland & Curtis Dozier
Vassar College (USA)

23. An Assessment of Reliability of k-Values in Two Rat Strains
Bryan T. Yanagita & Carla H. Lagorio
University of Wisconsin - Eau Claire (USA)

24. Effects of Varying the Delay of Reinforcement on Choice Behavior in Rats
Aldo Toledo, Raúl Ávila & Juan R. Alba
Universidad Nacional Autónoma de México (MX)

25. Intertemporal Choice in Between Sessions Transition: Preferences in Concurrent-Multiple Schedules
Oscar Zamora-Arevalo, Arturo Bouzas-Riaño, Tonatzin Cabrera-López & Mario Pérez Calzada
Universidad Nacional Autónoma de México (MX)

26. Sexual Risk Taking Under a Risk-Sensitive Foraging Framework
Anahi Collado, Jennifer M. Loya & Richard Yi
University of Maryland- College Park (USA)

27. Behavioral Momentum in Mixed and Multiple Schedules of Reinforcement
Robin Kuhn[1], Paul Cunningham[2] & Mark P. Reilly[1]
[1]Central Michigan University (USA) & [2]Utah State University (USA)

28. Impaired Timing as a Marker of Contaminant Exposure: Effect, Prevention, and Treatment
Derek Pope[1], Blake Hutsell[2], Daniel Hoffman & M. Christopher Newland[1]
[1]Auburn University (USA) & [2]Virginia Commonwealth University (USA) & [3]University of South Carolina Aiken (USA)

29. Within-Session Decreases in Responding during Extinction Sessions
Kenjiro Aoyama
Doshisha University (Japan)

30. Quantitative Analysis of Interactive Styles in Ambiguous Situations
Natalia Fuentes, Carlos Torres & Nora Rangel
University of Guadalajara (MX)

31. Coffee CS Improves Performance on the Cognitive Task
Mina Fukuda, Toshimichi Hata, Sakura Komatsu & Kenjiro Aoyama
Doshisha University (Japan)

32. Resurgence in a Free-Operant Psychophysical Procedure
John Y.H. Bai, Sarah Cowie & Christopher A. Podlesnik
University of Auckland (New Zealand)

33. Resurgence following Downshifts in Reward Magnitude: Evidence for a Functional Relation between Relapse and Shift Size
Andrew R. Craig, Ciara Marshall, Rusty W. Nall & Timothy A. Shahan
Utah State University (USA)

34. Resurgence of Humans' Button Clicking During a DRO Challenge
Shea M. Lemley, David P. Jarmolowicz, Michael Sofis & Jennifer L. Hudnall
University of Kansas (USA)

35. The Experimental Study of Metacontingencies in an Adapted Chess Program
João Claudio Todorov and Ísis Gomes Vasconcelos
Universidade de Brasília (Brazil)

36. Mongolian Gerbil's Behavioral Patterns Produced by Repeated and Periodic Exposure to Non-Contingent Aversive Stimulation
Camilo Hurtado-Parrado, Camilo Gonzalez, Monica Arias & Santiago Cardona
Konrad Lorenz Fundacion Universitaria (Colombia)

37. Concurrent Progressive-Ratio Schedules: Built-in Controls in the Study of Delayed Reward Efficacy
Michael Sofis, Jennifer Hudnall, Shea Lemley & David P. Jarmolowicz
University of Kansas (USA)

38. Dissipation of Conditioned Inhibition Can Explain Suboptimal Choice
Jennifer R. Laude & Thomas R. Zentall
University of Kentucky (USA)

End of Second Poster Session

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Research Articles

Theoretical Article

Translational Research

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Behavioural Processes

Society for the Quantitative Analyses of Behavior

Special issue:

SQAB 2013: Contextual Control

Guest Editor: Lewis A. Bizo

Thursday Evening, May 22
Room W471A

1st Poster Session*, Cash Bar & Registration*
(5:00-8:00 pm)

Friday, May 23
Room W470AB

7:00 *Registration, Coffee & Pastries*

8:30 **Timothy Shahan**
President's Introduction

Quantitative Analysis of Behavior

8:45 **Jay Moore**

9:20 **Terry Smith**

9:55 **William Baum**

10:30 *Break – Refreshments*

10:55 **Elliot Ludvig**

11:30 **Jack Marr**

12:05 *Lunch*

1:45 **Amy Odum**

2:20 **Christopher Newland**

2:55 *Break – Refreshments*

3:15 **Steven Hursh**

3:50 **Suzanne Mitchell**

5:00 ***Business meeting*****, Room W470AB**

6:30 ***2nd Poster Session & Cash Bar***
Room 471A
6:30-9:00 pm

Saturday, May 24
Room 470AB

7:15 *Registration, Coffee & Pastries*

8:30 **José E. Burgos**

9:05 **Takayugi Tanno**

9:40 *Break – Refreshments*

10:00 **Jack McDowell**

10:35 **Peter Killeen**

11:10 **Awards and Closing Remarks**

Saturday Afternoon, May 24

∫QAB Invited Preeminent Tutorials: From Basics to Contemporary Paradigms

1:00 Claudia Drossel
2:00 Daniel Gottlieb
3:00 John Staddon
4:00 Anna Kukekova

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