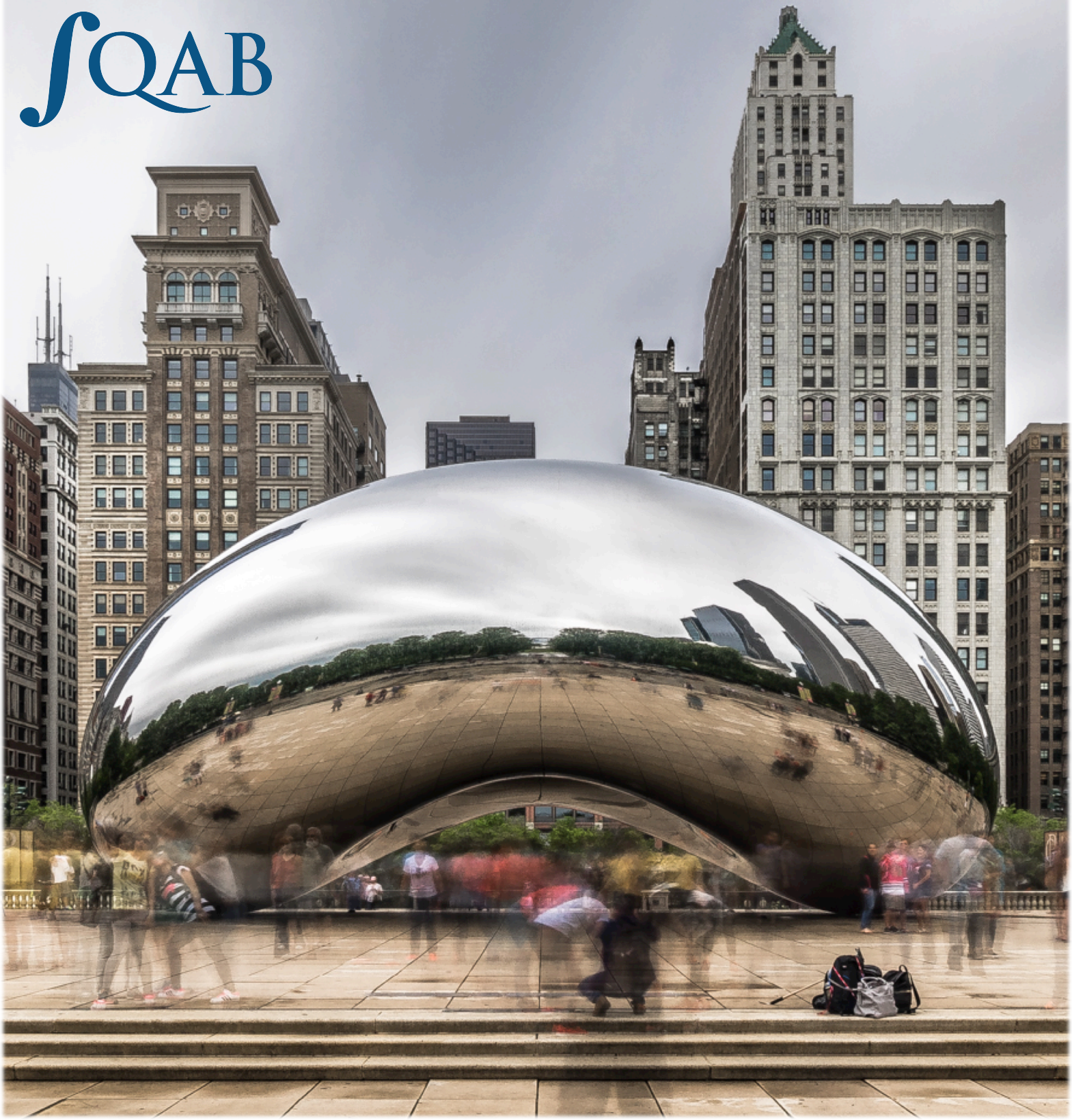
Society for the Quantitative Analyses of Behavior

39th Annual Meeting, May 27 - May 28, 2016

West Tower Hyatt Regency, Chicago, Illinois

SQAB



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, sqab.org

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Welcome to SQAB 2016

11 am - 12:45 pm Registration, West Regency Ballroom A

12:45 pm **President's Introduction**
Lewis Bizo
University of New England (Australia)

SQAB thanks the Association for Behavior Analysis International (ABAI) for generous support that helped to make this meeting possible, and encourages SQAB participants to take advantage of the ABA convention that begins immediately following the SQAB program. The ABAI Program includes many presentations on experimental and applied behavior science. A separate registration fee and badge are required to attend the ABAI meeting.

1 - 1:40 pm **The Momenta of Behavior: Disrupting the Organization of Operant Responses**

Federico Sanabria, Ryan J. Brackney, & Carter W. Daniels
Arizona State University (USA)

Behavior appears to be organized in bouts under a wide range of conditions, including operant reinforcement. Such organization implies that operant performance is more accurately described in terms of alternating behavioral states. The characteristics of this process may be inferred from three performance parameters (mean bout length, mean within-bout response rate, and mean bout-initiation rate) and their change within session. Various studies have identified potential behavioral mechanisms that maintain these parameters in equilibrium during stable performance. We examine here how these parameters change when performance is disrupted by extinction (EXT), non-contingent reinforcement (NCR), and pre-feeding (PRE) in various strains of rat (Wistar Kyoto, Long Evans, and Fischer). Training involved a tandem VI FR schedule with components implemented either in one or two levers. All three disruptors reduced response rate, but through different mechanisms. EXT and NCR progressively reduced bout-initiation rate and bout length, respectively. PRE reduced bout-initiation rate immediately upon session onset. EXT and PRE effects were empirically isolated in the two-lever preparation. These results are consistent with the notion that the arousing and signaling properties of reinforcement govern the alternation between behavioral states: arousal governs the frequency of entry into reinforced states (e.g., food-seeking), whereas feedback shapes the length of those states (and probably other characteristics of reinforced states, such as the topography of behavior within them). Estimates of performance parameters appear to dissociate these sources of control.

1:40 - 2:20 pm **The Return of the Operant**

Kennon A. Lattal, Carlos R. X. Cançado, James E. Cook,
Stephanie L. Kincaid, Tyler D. Nighbor, & Anthony C. Oliver
West Virginia University (USA)

The term "resurgence" describes both a set of methods and the behavioral product of those methods. As a method, resurgence is perhaps the most widely investigated, and applied, of several methods for generating previously reinforced operant responding. The conventional resurgence procedure involves three phases. A response reinforced in the first phase is eliminated in the second by reinforcing an alternative response, which in turn is extinguished in the third phase. The return in this third phase of the operant observed in the first phase is the behavioral product labeled resurgence. In this review, based on a series of experiments conducted in our laboratory, we will explore expansions of the definition, measurement, and methods used in the analysis of resurgence.

2:20 - 2:35 pm Break - Refreshments

2:35 - 3:15 pm **Toward a General Model of Momentum-Like Effects**

Timothy L. Hubbard
Arizona State University (USA)

Cognition and behavior exhibit biases consistent with future expectations, and some of these biases have been linked with the idea of momentum and described as momentum-like effects. Five such momentum-like effects (representational momentum, operational momentum, attentional momentum, behavioral momentum, psychological momentum) are described. It is suggested that each form of momentum-like effect reflects operation of a more general extrapolation mechanism that anticipates the future action, behavior, or outcome of a given target, person, or process, and that this general mechanism can operate at a variety of time scales. It is further suggested that representational momentum, operational momentum, and attentional momentum reflect similar or overlapping processes based on a perceptual time-scale and extrapolation primarily across space, and that behavioral momentum and psychological momentum reflect similar or overlapping processes based on a longer time-scale and extrapolation primarily across time. Characteristics of specific momentum-like effects (e.g., continuity, consistency of change, impenetrability to error feedback, rate of change) are noted. Properties of a more general extrapolation mechanism (e.g., dynamic representation, extrapolation of space and time, importance of environmental contingences, increases in adaptiveness, usefulness in bridging a gap in available information, importance of subjective consequences, automaticity, the extent of cognitive penetrability) are hypothesized. Issues relevant to any future general model of momentum-like effects (e.g., spatial-temporal dynamics, aspects of dynamic representation, roles of belief and functional architecture, variant and invariant experiences, importance of cognitive economy, implicit and explicit knowledge) are discussed.

3:15 - 3:55 pm **A Choice-Based Model of Resurgence**

Timothy A. Shahan & Andrew R. Craig
Utah State University (USA)

Resurgence is typically defined as an increase in a previously extinguished target behavior when a more recently reinforced alternative behavior is also placed on extinction. However, some treatments of the phenomenon have suggested that it might extend to circumstances where either the historic or more recently reinforced behavior are reduced by other non-extinction related conditions (e.g., punishment, decreases in reinforcement rate, increases in response requirements, etc.). We will present a model of resurgence in which the phenomenon in this broader sense is considered to result from the same processes generally considered to govern choice. In short, the model suggests that resurgence arises from changes in the *relative* values of the options across time--one that was historically more valuable and one that has been more recently valuable. From this conceptual framework, the way to formalize resurgence is to determine how various outcomes are related to value and how changes in those outcomes affect value across time. We will provide an example using this approach to generate a more specific quantitative model of extinction-induced resurgence.

3:55 - 4:10 pm Break - Refreshments

4:10 - 4:50 pm **Basing Assessment and Treatment of Problem Behavior on Behavioral Momentum Theory: Analyses of Behavioral Persistence and Resurgence**
David P. Wacker & Kelly M. Schieltz
University of Iowa (USA)

We will present two clinical analyses of DRA treatments based on behavior momentum theory. First, we evaluated if problem behavior that encountered extinction early in treatment resulted in less resurgence during subsequent extinction conditions. For six participants, a negative correlation of .83 occurred between the number of sessions required to reduce problem behavior during treatment to 90% of baseline, and subsequent resurgence of problem behavior. Second, we evaluated the persistence of academic responding during an extinction condition that was repeated intermittently during treatment for 1 student who had autism. Results showed that increased work engagement occurred following larger amounts of reinforcement, but less pronounced effects occurred over the duration of treatment. These results are similar to Wacker et al. (2011) in showing that persistence of treatment effects occurs gradually. Resurgence of problem behavior appears to be related to extinction, and persistence of desired behavior to rate or amount of reinforcement.

4:50 - 5:30 pm **Quantitative Models of Persistence and Relapse: Fits and Misfits**
John A. (Tony) Nevin
University of New Hampshire (USA)

Behavioral momentum theory has provided a useful model of persistence when responding is challenged by a wide variety of disruptors, including extinction. By assuming that persistence is determined by Pavlovian stimulus-reinforcer relations, the model accounts for the countertherapeutic increase in persistence that may arise in standard clinical treatments that employ alternative reinforcement. Tim Shahan and his past and current students (Chris Podlesnik, Maggie Sweeney, Andy Craig, and Paul Cunningham) have extended the model, with considerable success, to post-treatment relapse. However, some recent results from the Utah State lab not only fail to accord with model predictions but also challenge stimulus-reinforcer relations as fundamental determiners of persistence. Although the model is intuitively appealing and useful in many applications, it is time to explore alternatives.

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7 - 9:30 pm **First Poster Session & Cash Bar, West Regency Ballroom B**

7:45 - 9 am Registration, Coffee, & Pastries, West Regency Ballroom A

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9 - 9:40 am **Evaluating Persistence in Dogs: Applications for Problem Behavior and Odor-Detection Performance**

Nathaniel J. Hall[1], Alexandra Protopopova[2], & Clive D. L. Wynne[1]
[1]Arizona State University (USA), [2]Texas Tech University (USA)

Dogs are gaining a renewed interest as research subjects in comparative cognition and other research fields. Dogs, specifically pet dogs, have several potential advantages as research subjects because they display a wide diversity in morphology, behavior, and roles in humans society. This makes the dog a valuable, but complicated, research subject. I will discuss two recent research projects from our lab exploring persistence in pet dogs as case examples. In the first study, we were interested in Canine Compulsive Disorder, which is hallmarked by high rates of stereotypic behavior. Prior research in zoo animals indicates there is a correlation between the prevalence of stereotypic behavior and increased persistence in an extinction task. We evaluated whether a similar phenomenon was observed in pet dogs that engage in stereotypic behaviors in the home environment. In a second study, we were interested in increasing the persistence of dogs working on an odor detection task. We evaluated whether Pavlovian conditioning trials to a target odorant might lead to enhanced resistance to disruption of dogs working an odor discrimination task. In discussing these studies, I will highlight the advantages and disadvantages of working with dogs as behavioral research subjects. Last, I will discuss how utilizing dogs can yield research that borders between basic and applied research.

9:40 - 10:20 am **Using Demand Curve Approaches to Model Substance-Related Risk and Response to Treatment**

James G. Murphy
The University of Memphis (USA)

Behavioral economic models view substance misuse as a "reinforcement pathology" that is defined as a consistent pattern of elevated and inelastic demand for a substance. Recently, time- and cost-efficient demand curve measures have been developed and administered in clinical settings to measure both a) the impact of drug price and contextual features of the environment on reported consumption, and b) individual differences in demand for drugs These reports help generate "demand curves" that plot participants' hypothetical consumption at each price (e.g., the standard drinks a participant would purchase across a range of drink prices (e.g., free to $10 per drink). Expenditure curves plot expenditures at each price (i.e., number of drinks purchased multiplied by drink price). These demand and expenditure curves have been used to generate reliable and valid estimates of substance-related reinforcement including demand intensity (i.e., peak consumption at lowest price), elasticity (i.e., changes in the rate of consumption as a function of changes in price), maximum inelastic price (Pmax), greatest expenditure on alcohol (Omax), and breakpoint (i.e., the first price that completely suppresses consumption). The goal of this presentation is to review a series of studies demonstrating consistent associations between demand curve measures of substance-related reinforcement and a) various clinical measures of substance abuse severity, b) dynamic changes in desire to drink following an intervention or environmental manipulation, and c) changes in drinking over time.

10:20 - 10:40 pm Break - Refreshments

10:40 - 11:20 am **Environmental Triggers for Drug-Seeking: Links to Relapse**
Nadia Chaudhri
Concordia University (Canada)

Exposing abstinent addicts to drug-predictive cues in a laboratory setting evokes physiological responses and increases subjective reports of drug craving. This replicable finding has formed the basis for a concerted effort into uncovering the psychological and neurobiological underpinnings of cue-induced drug-seeking behaviour. Research in my laboratory, conducted using Pavlovian conditioning procedures with alcohol as the unconditioned stimulus, reliably finds that contexts associated with alcohol can serve as triggers for relapse. As well, we find that alcohol-seeking behaviour elicited by a discrete, alcohol-predictive cue is markedly modulated by the context in which the discrete cue is experienced. Finally, we observe that cues paired with alcohol can acquire incentive salience and function as conditioned reinforcers, properties that may contribute to ongoing alcohol use in individuals with (or without) alcohol use disorders. Our findings support the hypothesis that drug-predictive contexts exert a strong influence on behaviour, and have implications for preclinical models of relapse and laboratory-based procedures for studying reactivity to drug cues in humans.

11:20 - 12 pm **Individual Variation in Incentive Salience Attribution to Pavlovian Cues**
Terry E. Robinson & Alex B. Kawa
University of Michigan (USA)

Cues (conditional stimuli, CSs) that are associated with rewards can act as powerful temptations, leading to maladaptive behavior, such as overeating, or, in the case of drug cues, relapse. However, such cues come to exert powerful control over motivated behavior only if they are attributed with incentive salience, and thus aquire the ability to act as incentive stimuli, which: (1) attract attention to them; (2) are themselves desirable; and (3) can evoke a conditioned motivational state ("craving") that can instigate or energize actions to get them. However, despite the fact that reward cues may act as perfectly effective CSs, it turns out there is considerable individual variation in the extent to which they also acquire incentive motivational properties. In this talk I will first review studies showing that some rats (called sign-trackers, STs) are especially prone to attribute incentive salience to discrete food cues, relative to others (called goal-trackers, GTs), and that this predicts the propensity to attribute motivational properties to discrete drug (cocaine, opioid) cues. However, previous studies have only involved relatively limited exposure to drugs, and it is thought that more prolonged exposure is required for the development of addiction-like behavior. The effects of prolonged cocaine experience on subsequent motivation for cocaine in STs and GTs will be described, using a newly developed intermittent access self-administration procedure and behavioral economic metrics.

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12 - 1:30 pm Lunch – SQAB Executive Committee Meeting

1:30 - 2:10 pm **Persistence and Relapse in Heterogeneous Behavior Chains**

Eric A. Thrailkill & Mark E. Bouton
University of Vermont (USA)

Behavior chains are composed of linked responses that minimally include procurement followed by consumption. Several experiments in rats studied what makes chain responding persistent in extinction and what then makes it relapse. One set of experiments examined conditions that influence the persistence of procurement responding in extinction. Two methods that increased generalization across acquisition and extinction conditions (partial reinforcement in acquisition and the presentation of noncontingent reinforcers during extinction) led to greater persistence. A second set of experiments analyzed the contextual control of chained behaviors. As is true of single-trained responses, the context controls both the acquisition and extinction of behaviors that are members of a chain. For example, when the context is changed after extinction, renewed procurement and consumption responding are both observed. The results also suggest that a separately-extinguished consumption response is renewed when it is returned to the context of the chain. Here the preceding procurement response, but not its discriminative stimulus, was the "context" that initiated relapse. The research expands our understanding of behavior chains as well as their associative structure. They also expand our general understanding of the contextual control of instrumental (operant) behavior.

2:10 – 2:50 pm **Time, Trials and Extinction: Characteristics of Response Loss during Pavlovian Extinction**

Justin Harris & Jonas C. K. Chan
The University of Sydney (Australia)

Exposure to a conditioned stimulus (CS) in the absence of the reinforcing unconditioned stimulus (US) reduces the strength of Pavlovian conditioned responding. This is true when non-reinforced exposures to the CS occur during conditioning (i.e., partial reinforcement) or post-conditioning (extinction). When the CS-US interval is variable to prevent timing of US expectancy, the negative effect of non-reinforced exposure during conditioning is directly proportional to the total duration of CS exposure between USs. Thus the impact of reinforcement rate on the acquisition of responding is the same whether non-reinforcement is delivered as one continuous long exposure prior to reinforcement or it accumulates across multiple short non-reinforced exposures prior to a reinforced trial. However, this direct effect of exposure duration on conditioning does not characterise the negative impact of non-reinforcement during extinction of conditioned responding. Unlike the cumulative effect of non-reinforcement during conditioning, the effect of non-reinforcement during extinction is determined by the number of CS presentations (trials) rather than total duration of exposure. Further, in keeping with evidence that extinction is dependent on number of trials rather than amount of exposure, we have observed that extinction is affected by the per-trial reinforcement rate during conditioning rather than the cumulative reinforcement rate. That is, the partial reinforcement extinction effect depends on a reduction in the per-trial reinforcement during conditioning but not the cumulative reinforcement rate.

2:50 - 3:10 pm Break - Refreshments

3:10 - 3:50 pm **Resurgence and Relapse after Incentivized Choice Treatment**
Mark E. Bouton
University of Vermont (USA)

Research in this laboratory has recently investigated two paradigms that contain features of "contingency management" or "incentivized" treatments that are used clinically to suppress behavioral excesses such as smoking and drug abuse. In resurgence, a target operant behavior is first reinforced and then extinguished while a second behavior is reinforced to replace it (DRA). Although the first behavior is suppressed, it can "resurge" if the replacement behavior is extinguished, perhaps analogous to relapse after an incentivized treatment is discontinued. The results of a number of experiments support the view that resurgence occurs because the transition to testing introduces context change. Extinguished behavior is known to "renew" when the context is changed, and we show that treatments that encourage generalization from treatment to testing can reduce renewal and resurgence. However, the resurgence paradigm differs from contingency management in that the latter does not usually involve extinction; a return to smoking or drug taking during treatment would ordinarily be reinforced immediately. We have therefore begun to study relapse in a paradigm in which a replacement behavior is introduced and reinforced without extinguishing the first behavior. Although the treatment can suppress the first behavior, relapse is rapid when treatment ends (and the replacement behavior is no longer reinforced). The question is whether this form of relapse can also be slowed.

3:50 - 4:30 pm **Stepping Back From 'Persistence and Relapse' to See the Forest: Determinants of Associative Interference**
Ralph R. Miller & Cody W. Polack
State University of New York at Binghamton (USA)

Historically there has been considerable interest in a large variety of forms of associative interference. However, interest in clinical application and recent funding priorities has resulted in a narrowed focus on one particular instance of interference, extinction, with relative neglect of other types of interference. My laboratory has been using the existing literature and conducting new experiments trying to determine whether there is a consistent set of rules governing the occurrence and persistence of two-phase associative interference across (a) proactive and retroactive interference, (b) cue and outcome interference, (c) the type of training in Phase 1 (excitatory, inhibitory, or simple nonreinforcement), and (d) the type of training in Phase 2 (excitatory, inhibitory, or simple nonreinforcement). Our hope is that a return to more general questions concerning associative interference might reveal broad truths concerning the nature of forgetting. Identifying global principles of associative interference may also help us better appreciate the nature of extinction including how it can be enhanced and made more enduring as well as how it can be minimized and made fleeting.

4:30 - 4:35 pm **Joseph V. Brady Impactful Research Award**
Presented by Amy Odum, JEAB Editor
Utah State University (USA)

Closing Remarks
Lewis Bizo
University of New England (Australia)

4:35 pm **Business Meeting**
All SQAB members are welcome – West Regency Ballroom A

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7 - 9:30 pm **Second Poster Session & Cash Bar, West Regency Ballroom B**

∫QAB Invited Preeminent Tutorials: From Basics to Contemporary Paradigms

SQAB Preeminent Tutorials will be held in the Lucerne Room, Swissôtel as part of the annual meeting of the Association for Behavior Analysis International

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10 - 10:50 am **Reducing Impulsivity: Current Knowledge and Future Directions**
Gregory J. Madden & Jillian Rung
Utah State University (USA)

Chair: Amy Odum, *Utah State University (USA)*

Steeply discounting the value of delayed outcomes is robustly correlated with addictions and poor health decision-making. Longitudinal studies suggest that this form of impulsivity precedes and predicts acquisition of substance use, and animal studies reveal a similar pattern. Despite the evidence that delay discounting is a trait, this tutorial will review studies that have discovered methods for decreasing impulsive choice. We will discuss procedures that produce acute, context-dependent effects (e.g., framing effects), and when these may prove useful in positively influencing human decision making. We will also discuss learning-based procedures that have proven effective in humans (e.g., delay fading and working memory training) and nonhumans (e.g., interval-timing or delay-exposure training) in reducing impulsive choice. Finally, we will discuss practicality issues that will need to be addressed if learning-based approaches are going to impact human behavior. We will not discuss effects of drugs or neurological manipulations on impulsive choice.

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1 - 11:50 am **Philosophy of Science and the Quantitative Analysis of Behavior**
Randolph C. Grace & Brian Haig
University of Canterbury (New Zealand)

Chair: Lewis Bizo, *University of New England (Australia)*

Steeply discounting the value of delayed outcomes is robustly correlated with addictions and poor health decision-making. Longitudinal studies suggest that this form of impulsivity precedes and predicts acquisition of substance use, and animal studies reveal a similar pattern. Despite the evidence that delay discounting is a trait, this tutorial will review studies that have discovered methods for decreasing impulsive choice. We will discuss procedures that produce acute, context-dependent effects (e.g., framing effects), and when these may prove useful in positively influencing human decision making. We will also discuss learning-based procedures that have proven effective in humans (e.g., delay fading and working memory training) and nonhumans (e.g., interval-timing or delay-exposure training) in reducing impulsive choice. Finally, we will discuss practicality issues that will need to be addressed if learning-based approaches are going to impact human behavior. We will not discuss effects of drugs or neurological manipulations on impulsive choice.

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1 - 1:50 pm **Characterization of Delay Discounting Using Multiple Models and Effective Delay 50**
Chris Franck
Virginia Tech (USA)

Chair: Amy Odum, *Utah State University (USA)*

The study of delay discounting, or valuation of future rewards as a function of delay, has contributed to understanding the behavioral economics of addiction. Accurate characterization of discounting can be furthered by statistical model selection given that many functions have been proposed to measure future valuation of rewards. This tutorial will present a convenient Bayesian model selection algorithm that selects the most probable discounting model among a set of candidates chosen by the researcher. The approach assigns the most probable model for each individual subject using an asymptotic approximation to model probability based on the Bayesian Information Criterion. Importantly, effective delay 50 (ED50) functions as a suitable unifying measure that is computable for and comparable between several popular functions, including both one- and two-parameter models. Software to execute the combined model selection/ED50 approach is illustrated using empirical discounting data collected from a sample of 111 undergraduate students with five discounting models proposed between 1937 and 2006.

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2 - 2:50 pm **Associative Symmetry, Emergent Relations, and Stimulus Class Formation**
Peter J. Urcuioli
Purdue University (USA)

Chair: Greg Madden, *Utah State University (USA)*

Associative symmetry is one of a number of derived relations that can emerge after explicit training on other conditional relations. Here, untrained but accurate B→A conditional discrimination performances arise from training A→B conditional relations, a finding indicative of stimulus class formation (i.e., the development of sets of disparate but interchangeable stimuli). Recent research shows that human language capabilities are not necessary for associative symmetry; it can also reflect basic reinforcement and stimulus control processes. In this tutorial, I will describe the history of the now-successful search for symmetry in an animal other than humans (viz., the pigeon) and show how this important finding led to demonstrations of other rarely or never-before seen emergent relations in a non-human animal. Central to these demonstrations is my theory (Urcuioli, 2008) of the origin of stimulus classes in pigeons – specifically, the reinforcement contingencies of training, the nature of the functional stimuli, and the effect of common functional stimuli across different reinforced relations. The theory makes precise, testable and often confirmed predictions about the training conditions that should, and should not, yield emergent relations such as symmetry, transitivity, and reflexivity.

SQAB Invited Preeminent Tutorials are recorded and made available on iTunes and YouTube: youtube.com/c/SocietyfortheQuantitativeAnalysesofBehavior

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7 - 9:30 pm **First Poster Session & Cash Bar, West Regency Ballroom B**

1. Disicriminative Signaling of Outcomes Reduces Probabilistic Discounting in Pigeons and Rats
   Aaron P. Smith, Thomas R. Zentall, & Joshua S. Beckmann (University of Kentucky)

2. Standard Delay and Probability Discounting Tasks Together Predict Discounting of Rewards that are Both Delayed and Probabilistic
   Ariana Vanderveldt, Leonard Green, & Joel Myerson (Washington University in St. Louis)

3. Effects of Food-Related Cue Exposure on Delay Discounting for Hypothetical Food and Money
   Bailey E. Perschon & Erin B. Rasmussen (Idaho State University)

4. A Comparison of Two Techniques to Estimate Rates of Delay Discounting
   Benjamin P. Kowal & Jennifer L. Faulkner (University of Arkansas at Little Rock)

5. Temporal Framing and the Hidden Zero Effect: Rate-Dependent Outcomes on Delay Discounting
   Gideon P. Naudé, Amy J. Henley, Brent A. Kaplan, Derek D. Reed, & Florence D. DiGennaro Reed (University of Kansas)

6. Evaluating Differences in the Prevalence of Nonsystematic Data Across Discounting Tasks
   Thomas Argyle, Jodi Siri, Jillian M. Rung, & Gregory J. Madden (Utah State University)

7. Effects of Chronic Cocaine Administration and Delay Training on Impulsive Choice in Rats
   Joshua T. Lightfoot, Sammatha K. Harvin, Christine E. Hughes, & Raymond C. Pitts (University of North Carolina Wilmington)

8. Probability Discounting in the Rat Following NMDA Receptor Blockade: Effects of Ascending and Descending Probabilities
   Justin R. Yates, Kerry A. Breitenstein, Benjamin T. Gunkel, Mallory N. Hughes, Anthony B. Johnson, Katherine K. Rogers, & Sara M. Shape (Northern Kentucky University)

9. Measurement and Validation of Measures for Risky and Delayed Food and Monetary Choices
   Luis R. Rodriguez, Kelsie L. Hendrickson (San Antonio Military Medical Center), Erin B. Rasmussen, & Rebecca H. Rose (Idaho State University)

10. Relations Amongst Hypothetical and Operant Sunk Cost Tasks and Discounting
    Shea M. Lemley, Michael J. Sofis, & David P. Jarmolowicz (University of Kansas)

11. Effects of Potentially Real and Hypothetical Outcomes on Delay Discounting for Food
    Luis R. Rodriguez & Erin B. Rasmussen (Idaho State University)

12. The Magnitude Effect in Delay Discounting Research: It's All About the Contrast
Charles C.J. Frye, Ann Galizio, Jonathan E. Friedel, W. Brady DeHart, and Amy L. Odum (Utah State University)

13. The Relationship between "Pregaming" and Behavioral-Economic Alcohol Demand in College Students
Bianca C. Caracappa & Margaret P. Martinetti (The College of New Jersey)

14. Temporal Dynamics of Drinking and Operant Lever Pressing in the Presence and Absence of a Response-Reinforcer Contingency
Eric J. French, Valeria E. Gutierrez-Ferre (Universidad Nacional de Educacion a Distancia), Melissa M. M. Andrews, & Mark P. Reilly (Central Michigan University)

15. Pigeons Time Noisy Intervals
Shrinidhi Subramaniam & Elizabeth G. E. Kyonka (West Virginia University)

16. Evaluation of a Titrating Ratio Procedure for Assessing Reinforcer Value
Amy J. Henley & Florence D. DiGennaro Reed (University of Kansas)

17. Testing the Validity of a Matching Law-Based Estimation of Punishment Sensitivity
Bryan Klapes & Jack J McDowell (Emory University)

18. Procedural Determinants of Drug versus Food Choice
Jonathan J. Chow & Joshua S. Beckmann (University of Kentucky)

19. Effects of Nicotine on Performance in a Titrating Delayed Matching-to-Sample Task in Pigeons
Ann Galizio, Shandy A. Nelson, Jonathan E. Friedel, Charles C. J. Frye, & Amy L. Odum (Utah State University)

20. Fetal Alcohol Effects on Open Field Activity and Habituation in Mice
Andrew B. Hawkey, Hui Li, Wenhua Xu, Gang Chen & Susan Barron (University of Kentucky)

21. The Role of Estrogen in the Development of Alzheimer's Disease in the Female Sprague-Dawley Rat
Alexis C. Crump & Rodney D. Clark (Allegheny College Program in Neuroscience)

22. Effects of 4-OH-DET on Extinction of Ethanol-Seeking Behavior
Matthew Horchar & Rodney D. Clark (Allegheny College Program in Neurosciences)

23. The Role of Tactile Discriminative Stimuli on Reinstatement of Cocaine-Seeking Behavior
Elizabeth J. Sever, Adam J. Brandner, Daniel C. Dougherty, & Rodney D. Clark (Allegheny College Program in Neurosciences)

24. Renewal in Choice Behavior: Effect of Reinforcement Rate
Alejandra Valadez, Montserrat Arroyo, Yultzin Gaona, Daniella Lambarri, Eduardo Parra & Livia Sánchez-Carrasco (Facultad de Psicología, UNAM)

25. Human Self-Administration and Preference for Alcohol With or Without Caffeine: Caffeine Choice Reflects Differences in Subjective Effects of Alcohol
Mary M. Sweeney, Steven E. Meredith, & Roland R. Griffiths (Johns Hopkins University School of Medicine)

26. Strain and Baseline-Dependent Effects of Scopolamine on Operant Variations
Megan A. Arnold & M. Christopher Newland (Auburn University)

27. Dominance and Housing Effects on Individual Differences in Choice and Motivation
Jeremy R. Lott, Jennifer R. Peterson, Christian Davis, Andrew T. Marshall, & Kimberly Kirkpatrick (Kansas State University)

28. Reinforcement Learning Models of Dynamic Risky Decision Making in Rats
Andrew T. Marshall, Christian Davis, & Kimberly Kirkpatrick (Kansas State University)

29. Reinforcement Learning Accounts for Suboptimal Pigeons and Optimal Rats
Carter W. Daniels (Arizona State University), Jennifer R. Laude (Stanford University), & Federico Sanabria (Arizona State University)

30. Behavioral Momentum Theory Fails to Account for the Effects of Reinforcement Rate on Resurgence
Andrew R. Craig & Timothy A. Shahan (Utah State University)

31. Arousal and Resistance to Change in Multiple Schedules
Paul J. Cunningham & Timothy A. Shahan (Utah State University)

32. Predictable Changes in Relative Immediacy Alter Within-session Response Patterns
Daniel Bell-Garrison (West Virginia University), Elizabeth G. E. Kyonka (West Virginia University), & Randolph C. Grace (University of Canterbury)

33. Response-Topography Effects in Mice Performing Two Response-Withholding Tasks
Korinna Romero, Carter W. Daniels, Lauren T. Hewitt, Jason Newbern, M. Foster Olive, & Federico Sanabria (Arizona State University)

34. Response Initiation Improves Acquisition But Does Not Protect From Changes in Motivation in a Switch Timing Task
Ryan J. Becker, Carter W. Daniels, & Federico Sanabria (Arizona State University)

35. An Investigation into Predictors of Competitive Success in a Large-Scale Group Foraging Task
Bryan T. Yanagita, Christopher J. Cintron, Jackson A. Laughlin, William Gormley, & Derek D. Reed (University of Kansas)

36. Juggling Two Guided Skills: An Investigation of Behavioral Flexibility in Pigeons
Alliston K. Reid, Sara E. Futch, Julia M. Smith, Maureen Downs, Alexandria Bidgood, Caroline Starnes, & Vanessa Zarubin (Wofford College)

37. Chrysippus' Pigeon: Inference by Exclusion in an Avian Model
Marisol Lauffer, Leyre Castro, & Edward A. Wasserman (University of Iowa)

38. Discrimination of Multidimensional Visual Stimuli by Pigeons
Victor M. Navarro (The University of Iowa), Olga V. Vyazovska, (Karazin Kharkiv National University, Ukraine), & Edward A. Wasserman (The University of Iowa).

39. Evaluating the Reinforcing vs. Signaling Effects of Praise in Children with ASD
Corina Jimenez-Gomez, Ashley Abel, Michael E. Kelley, & Christopher A. Podlesnik (The Scott Center for Autism Treatment, Florida Institute of Technology)

40. Evaluation of Stimulus Equivalence Training for Producing Class Mergers
Jeanine R. Tanz, Ivy M. Chong-Crane, Brittany Boganski, Alexandrea Wiegand, Madison Smith, & Michael E. Kelley (The Scott Center for Autism Treatment, Florida Institute of Technology)

41. Evaluating the Generalizability of Direct Measures of Problem Behavior and Contingencies in General Education Elementary Classrooms
Johanna L. Staubitz & Blair P. Lloyd (Vanderbilt University)

42. The Effects of Permanent and Changing Stimuli on the Perception of Self-Movement
Pablo Covarrubias (Universidad de Guadalajara, Mexico) & Felipe Cabrera (Universidad de Guadalajara, Mexico)

7 - 9:30 pm **Second Poster Session & Cash Bar, West Regency Ballroom B**

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1. Delay Discounting: Lack of Magnitude Effect in Spontaneously Hypertensive (SHR) and Wistar Kyoto (WKY) Rats
   Carlos F. Aparicio, Michael Treacy, Nicole Dion, & James E. Bowman (Salem State University)

2. Discounting Rate and Sensitivity to Immediacy of Reinforcement in Spontaneously Hypertensive (SHR) and Wistar Kyoto (WKY) Rats
   Carlos F. Aparicio, Michael Treacy, Nicole Dion, & James E. Bowman (Salem State University)

3. Is the Size Important? Not after Frontal Lobe Damage
   Bartłomiej Swebodziński, Paweł Ostaszewski, & Wojciech Białaszek (University of Social Science and Humanities, Warsaw, Poland)

4. Frame the Small and Reflect the Large: Differential Effects of Amount on Reflection and Framing Effects in Probability Discounting
   Wojciech Białaszek, Przemysław S. Marcowski, & Paweł Ostaszewski (SWPS University of Social Sciences and Humanities)

5. Nucleus Accumbens Core Lesions Have Little Effect on Temporal Sensitivity in Impulsive Choice
   Melina S. Campa, Jennifer R. Peterson, & Kimberly Kirkpatrick (Kansas State University)

6. Effects of Treatment on Delay and Probability Discounting by Cocaine-Dependent Individuals
   Diana Mejía (National Autonomous University of Mexico), Leonard Green (Washington University in St. Louis), Joel Myerson (Washington University in St. Louis), Silvia Morales-Chainé (National Autonomous University of Mexico), & Javier Nieto (National Autonomous University of Mexico)

7. Delay of Gratification or Delay Discounting: A Comparison Between Self-Control Procedures
   Emmanuel Castro, César Corona, Migdalia Pérez, Aida Cuevas, & Raul Avila (National Autonomous University of Mexico)

8. Delay Discounting in Choices Between Imperfect Substitutes
   Taku Ishii (Wakayama Medical University)

9. An Experimental Test of the Additive Utility Model of Delay Discounting
   Jonathan E. Friedel & Amy L. Odum (Utah State University)

10. Delay Discounting of Different Outcomes by Smokers, Smokeless Tobacco Users, E-cigarette Users, and Non-users
    W. Brady DeHart, Charles Frye, Jonathan Friedel, Ann Galizio, & Amy L. Odum (Utah State University)

11. A Systematic Examination of Sex Differences in Sexual Delay Discounting Research
Mary M. Sweeney & Matthew W. Johnson (Johns Hopkins University School of Medicine)

12. Quantitative Analysis of Behavior Goes Out to the Street: Car Drivers' Choice Between Obey or Violate a Traffic Rule
Felipe Cabrera & Valeria Peregrina (University of Guadalajara)

13. The Copyist Model and Schedule Performance During and After the Changeover Delay in Concurrent Schedules
Takayuki Tanno (Meisei University)

14. Dynamic Choice in Concurrent Random Interval - Random Ratio Schedules
Arturo Bouzas, Alejandro Segura, Luis Baroja, & Manuel Villarreal (Univeridad Nacional Autónoma de México)

15. Learning to Change: Stimulus Discriminability Affects Adaptation to Contingency Change.
Sarah Cowie, Michael Davison, & Douglas Elliffe (The University of Auckland, New Zealand)

16. Post-Reinforcer vs. Post-Response Responding: Same, Similar, or Different?
Stephanie Gomes-Ng, Douglas Elliffe, & Sarah Cowie (University of Auckland, New Zealand)

17. Matching Behavior In Bivo: A 3-Year Analysis of the Stability of Response Allocation of Two School Children in Classrooms
Anne-Josée Piazza, Jacques Forget, Pier-Olivier Caron, Philippe Valois, & Carolanne Ponton (Université du Québec à Montréal)

18. Rats' Conditioned Inhibition Does Not Dissipate in a Suboptimal Choice Procedure
R. Emmanuel Trujano, Paulina López, & Vladimir Orduña (Universidad Nacional Autónoma de México)

19. Another Perspective on the Magnitude Effect: Not Only the Value of a Single Outcome, but Also the Number of Payoffs Matters
Przemysław S. Marcowski, Wojciech Białaszek, & Paweł Ostaszewski (SWPS University of Social Sciences and Humanities)

20. Rats Behave Optimally in a Sunk Cost Task in which Pigeons Do Not
Nataly Yáñez, Arturo Bouzas, & Vladimir Orduña (Universidad Nacional Autónoma de México)

21. Acquisition of Schedule-Induced Drinking as a Function of Temporal Proximity Between Drinking and Food Delivery
Jorge A. Ruiz (Universidad Autónoma de Baja California), Peter R. Killeen (Arizona State University), & Ricardo Pellón (Universidad Nacional de Educación a Distancia)

22. Schedule-Induced Drinking and Performance in the Peak-Procedure
Gabriela E. López-Tolsa & Ricardo Pellón (Universidad de Educación a Distancia)

23. Delay Gadients to Food Among Different Schedule-Induced Behaviors Pedro Vidal, Valeria E. Gutiérrez-Ferre, & Ricardo Pellón (Universidad de Educación a Distancia)

24. Effects of Variable Sequences of Food Availability on Interval Time-Place Learning by Pigeons Francisco Aguilar Guevara, Daniel García-Gallardo, Sergio Moreno, Mitzi Hernández, & Claudio Carpio (Univeridad Nacional Autónoma de México)

25. Context Effects in a Temporal Production Task
Marilia Pinheiro de Carvalho (University of Minho), Armando Machado (University of Minho), & Marco Vasconcelos (University of Minho and University of Oxford)

26. Determinants of Temporal or Stimulus Control in Humans and Rats
Paulo Guilhardi (Beacon ABA Services, Inc.), Tatiane Panzarini Labliuk, (Federal University of ABC) André Mascioli Cravo, (Federal University of ABC), Russell M. Church, (Brown University), & Marcelo Salvador Caetano (Federal University of ABC)

27. Using an Inhibitory Stimulus as a Punishing Consequence
Vikki J. Bland (The University of Auckland), Sarah Cowie (The University of Auckland), Douglas Elliffe (The University of Auckland), & Christopher A. Podlesnik (Florida Institute of Technology)

28. Persistence of Target Behavior in the Presence of Additional Contingent Reinforcement
T. Mary Foster, James S. McEwan, & Timothy L. Edwards (University of Waikato)

29. Relations Between Persistence and Resurgence in Humans Engaging in a Computer Task
Toshikazu Kuroda (Aichi Bunkyo University), Carlos R. X. Cançado (Universidade de Brasília), & Christopher A. Podlesnik (Florida Institute of Technology)

30. The Effects of Punishment on Resistance to Change and Reinstatement in Rats
Tomesha M. Farris, Cynthia J. Pietras, & Kevin Anderson (Western Michigan University)

31. Reinstatement, Renewal, and Ressurgence: The Effects of Reinforcer and Response Rates
Amanda Calmon & Josele Abreu-Rodrigues (Universidade de Brasília)

32. Effects of the Inhibitory Context-Response Association on the Reacquisition of Instrumental Responding
Mariana Gallegos-Rocha & Livia Sánchez-Carrasco (Universidad Nacional Autónoma de México)

33. A Reminder of Extinction Reduces Relapse in an Animal Model of Voluntary Behavior
Tere Almazán Mason (National University of Mexico), Metin Uengoer (Philipps-Universität Marburg), & Javier Nieto (National University of Mexico)

34. Social Context-Switch Effects on the Reacquisition of Appetitive Responses in Rats
Rodolfo Bernal-Gamboa, & Javier Nieto (National University of Mexico)

35. Selective Effect of Lever Height Relative to Rat Forepaw on Within-Bout Response Rate
Angel Andres Jimenez (University of Guadalajara), Federico Sanabria (Arizona State University), & Felipe Cabrera (University of Guadalajara)

36. Effect of Saccharin Consumption on Body Weight and Operant-Responding Reinforced by Sucrose in Rats
Kenjiro Aoyama (Doshisha University)

37. Frequency and Magnitude of Reinforcement in Multiple Schedules: Short Component Durations Show Sensitivity to Frequency Higher than to Duration of Access to Food
J. C. Todorov, Carlos Cançado, Raquel Aló, Pablo Souza, Leandro S. de Paula (Universidade de Brasília), & Kennon A. Lattal (West Virginia University).

38. Darkness and End-of-Session Stimuli as Positive Reinforcers for Raphael Catfish on Fixed-Ratio Schedules
Joseph J. Pear, Joseph J. Jasin, Joseph D. J. Mikolash, & Jordan J. Chaput (University of Manitoba)

39. Does Near-Miss Feedback Cause Greater Persistence in Humans?
Joshua J.H. Yong, Jeffrey M. Pisklak, & Marcia L. Spetch (University of Alberta)

40. A Functional Analysis Of Near Miss Events On Cumulative Responding During Extinction
Jeffrey M. Pisklak, Joshua J.H. Yong, & Marcia L. Spetch (University of Alberta)

41. Is the Effect of Decaffeinated Coffee Extinguished by the Extinction Procedure?
Mina Fukuda (Doshisha University / Japan Society for the Promotion of Science) & Kenjiro Aoyama (Doshisha University)

42. Fragility of Discriminative Control in Oculomotor Learning
Sohir Rahmouni, Jéremie Jozefowiez, & Laurent Madelain (University of Lille)

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Behavioural Processes

Editors: Johan J. Bolhuis & O. Lazareva

Special issue:

SQAB 2015: Choice and Consequences

Guest Editors: Lewis A. Bizo and Christopher A. Podlesnik

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Volume 105, Issue 3

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Research Articles

Technical Articles

Announcing the 33rd Annual Meeting of the

Southeastern Association for Behavior Analysis

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Jonathan Katz, National Institute on Drug Abuse
Lori Knackstedt, University of Florida
K. Matthew Lattal, Oregon Health and Science University
Matthew Normand, University of the Pacific
Kathryn Peterson, Munroe-Meyer Institute
Derek D. Reed, University of Kansas

…and more! Please check out the SEABA website for a complete list of speakers.

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We are pleased to offer BACB Continuing Education Units at this year's SEABA conference. Please visit www.seabaonline.org for membership, registration, and hotel information.

SQAB 2016 at a Glance

Friday, May 27
West Regency Ballroom A/B

11:00 *Registration*

12:45 **Lewis Bizo**

President's Introduction

Persistence and Relapse

1:00 **Federico Sanabria**

1:40 **Kennon A. Lattal**

2:20 *Break – Refreshments*

2:35 **Timothy L. Hubbard**

3:15 **Timothy A. Shahan**

3:55 *Break – Refreshments*

4:10 **David P. Wacker**

4:50 **John A. (Tony) Nevin**

7:00 ***1st Poster Session & Cash Bar***

Saturday, May 28
West Regency Ballroom A/B

7:45 *Registration, Coffee, & Pastries*

9:00 **Nathaniel J. Hall**

9:40 **James G. Murphy**

10:20 *Break – Refreshments*

10:40 **Nadia Chaudhri**

11:20 **Terry E. Robinson**

12:00 *Lunch, Executive Committee Meeting*

1:30 **Eric A. Thrailkill**

2:10 **Justin Harris**

2:50 *Break – Refreshments*

3:10 **Mark E. Bouton**

3:50 **Ralph R. Miller**

7:00 ***2nd Poster Session & Cash Bar***

Sunday, May 29
Lucern Room in Swissôtel

SQAB Invited Preeminent Tutorials

10:00 **Gregory J. Madden**

11:00 **Randolph C. Grace**

2:00 **Chris Franck**

3:00 **Peter J. Urcuioli**