



**MARIAN BRELAND BAILEY:  
A GENTLE WOMAN  
FOR ALL SEASONS**

ROBERT E. BAILEY  
Hot Springs, Arkansas

**M**arian Breland Bailey (b. Kruse, December 2, 1920) died September 25, 2001. She was an accomplished scientist, teacher, writer, animal trainer, and humanitarian. She was my loving wife and a devoted mother. Marian also was the last of the Hot Springs, Arkansas Threesome that forever changed behavioral psychology, especially animal training. It is my privilege to share for the first time the fascinating story of Marian and Keller Breland (d. 1965), and Grant Evans (d. 1997).

Behavioral psychologists and other scientists know that Marian and Keller Breland were students and associates of B. F. Skinner. Sparked by their work on Skinner's famous Pigeon in a Pelican project during the war, they left their nearly completed psychology doctoral programs in 1943, formed a company called Animal Behavior Enterprises (ABE), and made their living applying Skinner's laboratory work. The Brelands believed that making operant conditioning work commercially would speed the acceptance of Skinner's discoveries and could accelerate a humane approach to animal training.

Keller and Marian knew that entertaining people was key to their future business success. Rather than working exclusively with rats and pigeons, the Brelands knew that they must enter the exotic animal world usually reserved for circus and dog trainers. Part of their stated mission was to make animal training more effective and humane. Knowing that traditional ani-



*In Memoriam: Marian Breland Bailey 1920-2001*

mal trainers would not change their methods simply because the Brelands said they should, the Brelands set out to validate their own case.

The Brelands based their new system of training on operant conditioning. Animal training was thousands of years old, but trainers had not used reinforcement systematically. Marian pro-

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# FOR THE RECORD

CHRISTINE E. HUGHES, RAYMOND C. PITTS,  
Editors, *Division 25 Recorder*

**W**e are very happy to complete our second issue of *The Recorder*. Health issues have slowed us down this past year, but we are approaching the end of our struggle and wanted to send this issue before the conference. We apologize to Division 25 members for our delay and, especially, to the contributors to this issue, who met our initial deadlines, but then had to wait so long for the product of their labors.

For this issue, Robert Bailey graciously wrote a memorial to Marian Breland Bailey (1920-2001). In his memorial, he describes the history of Animal Behavior Enterprises and the many accomplishments of not only Marian, but also of Keller Breland and Grant Evans - the "Arkansas Threesome."

Also included in this issue is an article by the 2002 recipient of the Don Hake Basic/Applied Research Award, Jack Michael. We hope that 2003 award winners will submit short articles based on their APA addresses for consideration for publication in *The Recorder*. We also would like to invite award winners from the years 2000-2002 to submit articles based on their APA addresses if they are interested.

An important feature of this issue is a copy of Division 25's program for the upcoming APA conference in Toronto. Kate Saunders has arranged an excellent program, and we thank her for her hard work. As "2nd program chair" this year, I (CH) learned a lot about organizing and submitting the program from

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## DIVISION 25 EXECUTIVE COMMITTEE

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## THE DIVISION 25 RECORDER

**T**he *Division 25 Recorder* is the official publication of the American Psychological Association's Division 25 for Behavior Analysis. Historically, it has been published three times a year (Spring, Summer, and Winter) and received by the Division 25 membership, Division affiliates, student affiliates, and individual and institutional subscribers. The newsletter also is sent to the presidents and newsletter editors of the other APA divisions, officers of APA, the American Psychological Society, the Association for Behavior Analysis, and the Association for the Advancement of Behavior Therapy.

The *Division 25 Recorder* informs readers about the Division and APA governance and membership activities. It publishes letters to the editor, open letters to the Division's Executive Committee, news and notes about experimental, applied, and conceptual analyses of behavior. The newsletter is not an archival publication for scientific manuscripts, but will occasionally publish unsolicited comments and queries.

Submissions should be sent to Dr. Christine E. Hughes (Co-Editor) or Dr. Raymond C. Pitts (Co-Editor), The Division 25 Recorder, Department of Psychology, University of North Carolina at Wilmington, 601 S. College Road, Wilmington, NC, USA 28403-5612 (tel 910-962-7795 or -7293; email: hughesc@uncw.edu or pittsr@uncw.edu). Subscriptions and changes of address for regular affiliate, student affiliate, individual, and institutional subscriptions should be sent to Thomas S. Critchfield, Secretary Division 25, Department of Psychology, Illinois State University, Campus Box 4620, Normal, IL, USA, 61790-4620. Changes of address for APA members of the Division should be sent directly to APA.

Deadline for submissions for the next issue is

**OCTOBER 1.**

FOR THE RECORD: (continued from page 2)

Kate and will put these skills to good use during this coming year. The deadline for submissions for the 2004 APA meeting in **Honolulu, Hawaii** is sooner than we may think. I encourage and welcome any suggestions about and submissions of symposiums or presentations.

This is the second issue sent electronically. We received very positive feedback about the format of the previous issue; this reinforcement has strengthened our use of email for future dissemination of *The Recorder*. In future issues, we would like to highlight behavior-analysis doctoral and, especially, masters-level programs or concentrations within programs. As our Division member-base is quite broad, we thought this would be a good way of letting others, who may not come into contact with the programs, know about potential outlets for their students. **BA**

## 2003 DIVISION 25 AWARD RECIPIENTS

### **B.F. Skinner New Researcher Award:**

Sung Woo Kahng  
*Kennedy Krieger Institute*

### **Don Hake Basic/Applied Research Award:**

William McIlvane  
*University of Massachusetts – Shriver Center*

### **Fred S. Keller Behavioral Education Award:**

Linda Hayes  
*University of Nevada-Reno*

### **Outstanding Applied Research Award:**

Brian Iwata  
*University of Florida*

### **Outstanding Basic Research Award:**

Joseph Brady  
*Johns Hopkins University  
School of Medicine*

### **Outstanding Dissertation Award:**

Jason Landon  
*University of Auckland*

Honorable mention:  
Erin Rasmussen – *Auburn University*

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M. Christopher Newland  
*Auburn University*

posed that the Brelands concentrate on studying reinforcement, specifically the secondary reinforcer, or bridging stimulus, (a Breland-coined word, now commonly used), with several species under various environmental conditions, with the objective of demonstrating the superiority of the new methods. The information gathered on multiple species would extend what was already known about reinforcement, providing data that might persuade traditional animal trainers to embrace the new technology.

The Brelands began their systematic study of reinforcement in 1944. Part of their program involved an exhaustive page-by-page analysis of Skinner's (1938) monumental work, *The Behavior of Organisms*. They then replicated much of Skinner's work with other species. It took several years to complete this work, and Marian's analyses and conclusions provide a window into the Brelands' early recognition of the importance of behavior analysis.

In their study of the relation between reinforcement and strength of behavior, they used chickens, parakeets, pigs, cats, hamsters, goats, sheep, and numerous other species. The Brelands quickly discovered the value of closely associating the primary and secondary reinforcer and were soon extending the physical distance separating themselves and their animal subjects. They were remotely training behaviors.

By this time, Marian and Keller had started a family, just one more complexity that Marian handled with aplomb. Marian did most of the experimentation and data collection because Keller was busy earning a living for the family, first as a personnel director, and then on the road giving shows using Marian's trained animals. Keller built the equipment for the shows and behavioral experiments.

Consistency and timing were important, and the Brelands recognized the importance of accurate and mechanized data collection. Having grown up during the depression era, Marian brought with her a steely resolve to "do the job, and do it right." She also was intensely loyal to her family, friends, and coworkers and had an ability to make do. She was a packrat and saved almost everything,

much to the consternation of those around her. Her colleagues learned not to say much, however, because more than once her phobia for discard saved the day.

The Brelands recognized data as the lifeblood of experimental psychology, and they used data as very few psychologists had used them before. Unlike Skinner's discovery of operant conditioning and other experimental psychologists who sought to understand the relation between behavior and the environment, the Brelands' applied approach used data and instruments to optimize changing animal behavior and to improve the reliability and accuracy of the behavior.

By 1944, the Brelands routinely used photography to analyze behavior and behavior precursors. The Brelands had gone beyond the simple collection of on-off switch responses, though they continued to use conventional Skinnerian devices such as kymographs, relays, and switches. They attempted to describe objectively the complexities of real day-to-day animal behavior. They developed the observational skills that would serve them in the future when they began to study pieces of behavior, or responses, in the context of an animal's constellation of natural behaviors; what some would call a more ethological perspective.

By 1950, the Brelands had made a success of their business. They also were confident that operant conditioning principles could be generalized to include the behavior of any species, including humans. It was with euphoria that the Brelands published *A Field of Applied Animal Psychology* (1951). Fred Skinner was effusive in his praise of the Brelands' founding of this new field. This also was the beginning of what was to become the systematic application of behavior analysis by commercial and governmental agencies such as Sea World and the Navy Dolphin Project.

It was about this time that the Brelands moved to Hot Springs, Arkansas and met Grant Evans. Keller was looking for a film cameraperson to document animal behavior using high-speed cinematography, and Grant was, amongst many other things, a card-carrying union cameraman. Grant was largely self-taught. In spite of little formal education beyond high school, he could read and understand complex tech-

nical manuals. He also was an inventor and could build sophisticated and novel hardware that worked. He was an intellectual in the truest sense of the word, enjoying math and logic puzzles as well as reading classic literature. Grant was a "free-floating genius," and when he came aboard ABE, the Arkansas Threesome was born. Grant rapidly became an expert in the design and fabrication of devices necessary to conduct more sophisticated behavioral experiments, in experimental design, and in animal training, first working with Marian on remotely training cats for television commercials.

During these years, I entered the picture. As the Director of Training for the U.S. Navy's Marine Mammal Project, I made my first trip in 1962 to visit the Brelands and Grant Evans. It was a mind-altering experience for me. My views on behavior, and how to change it, changed virtually overnight. I watched ABE trainers move from dogs, to cats, to otters, to pigs, to domestic cattle, and so on, and after each move, adapt instantly to the different environments and reinforcement contingencies. I discovered what real training could be and what it could do.

Marian knew how to organize and motivate people as well as how to have a good time and how to help others have a good time. One of Marian's ideas of a good time was an intellectual discussion, and in 1953, she had begun a tradition that lasted for decades, something Keller called the "evening prayer meeting." These meetings, held in the Brelands' farmhouse living room, lasted for hours, often to the wee hours of the morning, as Keller, Marian, and Grant discussed the issues of the day. For me, this was the most mind-expanding experience of all. The discussion topic might jump from a training plan for a new macaw act to a more efficient method of teaching turkeys to operate a model train to a better way to dye a goose red for a TV commercial to analyzing an article from a psychology journal. The breadth and speed of these discussions were breathtaking. This group talked about changing behavior with the ease that most people talked about changing clothes. Their understanding of the process of changing behavior was beyond anything I had seen or heard.

Marian was the official recording sec-

retary and could write at a blistering pace, using some peculiar variant of Gregg shorthand. She was responsible for keeping discussions on-track and served as the group's oracle regarding the psychological literature. Marian was a gifted speed-reader with a near photographic memory and usually could quote the substance of articles relevant to the discussion. If she could not recall a specific article, she would go to a large cabinet containing thousands of index cards summarizing 20 years of her scrutiny of the scientific literature. If the group needed information concerning ABE's training program, such as numbers of reinforcements or time needed to train certain behaviors, Marian could quickly retrieve the data from ABE's system of training records, a system she designed and kept in exquisite detail.

These get-togethers and Marian's meeting notes were the foundation of the Brelands' landmark work *The Misbehavior of Organisms* (1961), in which they introduced the phenomenon of instinctive drift, and of their textbook *Animal Behavior* (1966). Though never popular in the psychological community, *Animal Behavior* was widely read by contemporary biologists and ethologists. Many animal trainers today prize their out-of-print copy of *Animal Behavior*, and find it still useful and interesting.

Marian, Keller, and Grant were above all, intellectuals. Curiously, they were intellectuals outside of the academic mainstream, and they knew it. They were often ostracized, and their efforts to publish rebuffed. They even described what they did as garbage-can science. What is clear is that they respected science and the scientific method. All three were resourceful scientists of great integrity. They turned their concept of an experimental laboratory into something resembling a behavioral factory with more than 40 full-time employees, producing literally thousands of animals.

What they had developed was the most advanced mass-production training methodology in the world. Some have been surprised at the Brelands' willingness to share their new technology. Their training farm was open to all, even competitors, and the Brelands charged nothing for this access. It was here they also developed automated coin-operated animal shows (e.g., chickens dancing and

playing tic-tac-toe, ducks playing the piano and the guitar, and rabbits gambling and riding fire trucks). These animal shows were sent all over the world accompanied by no more than written instructions. The necessary behavioral maintenance was built into elegantly simple electromechanical controls, designed mostly by Grant; ABE produced hundreds of these devices.

The list of firsts for ABE and the Brelands includes their dolphin and parrot shows, husbandry behaviors with many species, longest running TV commercial (Buck Bunny with Coast Federal Savings), the first automated animal shows, the most animals trained, the most species trained. The Brelands' success was not overlooked by government agencies (much of this work is still classified) and large corporate entities. Sea World, Busch Gardens, and Taft Broadcasting, among others, hired senior ABE staff to develop their training programs. Much of the technology developed by the Brelands spread from Hot Springs to all parts of the world.

Another first came in 1963 when Keller and Marian were asked to apply their expertise to developing an operant-based training program for the mentally retarded and ward attendants in Louisiana. Marian spent time on-site, designing and implementing a behavior program that became a spectacular success. Marian contributed to one of the first published manuals to describe the application of behavior analysis to teaching the mentally retarded, *Teaching the Mentally Retarded: A Handbook for Ward Personnel* (1965). Later, Marian served in many capacities in mental health facilities in Arkansas.

In the early 1950s, Keller and Marian recognized the importance of public and peer acceptance of operant conditioning. They gained exposure to the popular media of the day: *Time*, *Life*, *Colliers*, *Popular Mechanics*, *Popular Science*, *Wall Street Journal*, *The Today Show*, *The Tonight Show*, *Dave Garroway*, in literally hundreds of public events and publications. Sadly, the psychologists of the day were critical of such media exposure, further isolating the Brelands. Only recently has the behavior-analysis community awakened to the need for public acceptance of their science and technology and applauded those success-

ful in using the media. This is another example of Marian and Keller being ahead of their time.

Few outside of Marian's inner circle know of her brushes with death, mostly related to bouts of cancer. It was during one of these illnesses in the late 1960s that I became General Manager of the company while she recuperated. Rather than rest, she decided to complete her Ph.D. at the University of Arkansas while continuing as President of ABE. Fred Skinner pointed out to Jack Marr (Marian's advisor) that she probably set an all-time record between the time she began her Ph.D. studies at Minnesota in 1941, and the time she received the degree in 1978.

Marian was a gifted teacher. She taught her first animal training class in 1948, teaching General Mills feed salesmen how to train and maintain behavior in domestic animals and to give animal shows. She wrote what may well be the first detailed animal training manual replete with the proper experimental jargon. Marian reentered the teaching classroom in 1979 at Garland County Community College and joined the psychology department at Henderson State University in 1981 where she served as a professor until her retirement in 1998. She was much loved and respected by faculty and students of all stripes as attested to by an endowed scholarship in her name.

In 1996, Marian and I began teaching operant conditioning workshops to animal trainers. Similar to a teaching model developed by Marian in 1948, we incorporated chickens into the classroom. The classes were successful beyond our expectations and when Marian retired from Henderson, we began traveling around the U.S. and Canada pulling a little trailer full of chickens. Marian continued teaching these classes right up to the time she died. She wanted to leave the world as Skinner did, working right to the end.

Marian, Keller, and Grant used experimental psychology methods and techniques to study and change behavior. They did it because that is how they earned their livings, because they were curious about behavior, and because they

American Psychological Association  
Toronto

# DIVISION 25, BEHAVIOR ANALYSIS CONVENTION PROGRAM

August 7-10, 2003

## Thursday, August 7, 2003

9:00-10:50 AM, Metro Toronto Convention Centre

APA PLENARY SESSION - Includes a retrospective tribute to Neal Miller (1909-2002)

2:00-3:50 PM, Metro Toronto Convention Centre, Meeting Room 103B

PAPER SESSION Bringing Developmental Disabilities Into the Laboratory: Bridging Research and Application

Chair: **Chris Newland**

Interspecies Behavioral Comparisons Using Identical Tasks: Rats, Monkeys, and Kids. Merle Paule (Univ. of Arkansas, Nat'l Center for Toxicological Res.)

Translational Research in the Human Operant Lab. **Dean C. Williams** (Univ. of Kansas), Co-author **Michael Perone** (W. Virginia Univ.)

Modeling Intellectual Disability in Rodents and Primates: Toward Material Equivalence. **William J. McIlvane** (UMMS Shriver Center)

Mercurial Advisories: Conflicting Evidence About Contaminants, Nutrients, and Life Span Development. **Chris Newland** (Auburn Univ.)

4:00 - 5:50 PM, Crowne Plaza Toronto Centre Hotel, High Park Room

DIVISION 25 EXECUTIVE COMMITTEE MEETING

Chair: **Carol Pilgrim**

## Friday, August 8, 2003

8:00 - 9:50 AM, Metro Toronto Convention Centre, Meeting Room 205C

AWARD PRESENTATIONS

Outstanding Applied Research Award: **Brian Iwata** (Univ. of Florida). In Defense of the 15-Minute Session.

Outstanding Basic Research Award: **Joseph V. Brady** (Johns Hopkins). Behavioral Research and the Gifts of a Fortuitous Environment.

Don Hake Basic/Applied Research Award: **William J. McIlvane** (UMMS Shriver Center). Translational Behavior Analysis: From Laboratory Science to Intervention.

Fred S. Keller Behavioral Education Award: **Linda Hayes** (Univ. of Nevada – Reno). Edge of Chaos.

10:00 AM -1:50 PM, Metro Toronto Convention Centre

Thematic Program (Divisions 12, 25, 28, 38, 47, 49, 50): Optimizing the Quality of Life in Sickness and Health I.

Thematic Program (Divisions 1, 2, 3, 6, 7, 15): The Rational "Mind" – Includes keynote addresses by Daniel Kahneman and Edward Wasserman.

2:00 - 2:50 PM, Metro Toronto Convention Centre, Meeting Room 711

AWARD PRESENTATIONS

B. F. Skinner New Researcher Award: **Sung Woo Kahng** (Kennedy Krieger Inst.). Treatment Challenges in Severe Behavior Disorders: Prevention and Early Intervention

Outstanding Dissertation Award: **Jason Landon** (Univ. of Auckland, NZ). Choice Behavior: Short- and Long-Term Effects of Reinforcers.

3:00 - 3:50 PM, Metro Toronto Convention Centre, Meeting Room 711

INVITED ADDRESS

**Michael Stoutimore** (Family Safety Prog., Florida Dept. of Children and Families) Florida Child Welfare Behavior Analysis Services Program. Co-author: **Teresa Rodgers**

Chair: **Raymond C. Pitts**

4:00-4:50 PM, Metro Toronto Convention Centre, Meeting Room 203A

PRESIDENTIAL ADDRESS

**Carol Pilgrim** (UNC-Wilmington). Science and Human Behavior 2003: New Challenges, New Opportunities.

Chair: **William J. McIlvane**

5:00-5:50 PM, Metro Toronto Convention Centre, Meeting Room 203A

DIVISION 25 BUSINESS MEETING

Chair: **Carol Pilgrim**

**Saturday, August 9, 2003**

9:00-10:50 AM, Metro Toronto Convention Centre, Meeting Room 202B

PAPER SESSION: New Developments in Behavioral Systems of College Instruction

Chair: **Kathryn J. Saunders**

Rule-Based Learning in a Programmed Instruction Tutor for Java. **Henry H. Emurian** (Univ. Maryland, Baltimore Co.)

User-Friendly Behaviorally Informed Techniques for College Courses. **Philip N. Himeline** (Temple Univ.)

Overcoming Static: Design of an Instructional System to Teach Engineering Physics. **M. Jackson Marr** (Georgia Tech Univ)

11:00 AM - 2:50 PM, Metro Toronto Convention Centre

Thematic Program (Divisions 12, 25, 28, 38, 47, 49, 50): Optimizing the Quality of Life in Sickness and Health II.

Thematic Program (Divisions 1, 2, 3, 6, 7, 15): The Emotional "Mind" – Includes a panel discussion by Martin Seligman, Nathan Fox, Linda Spear, & Richard Ryan.

3:00 - 4:50 PM, Metro Toronto Convention Centre

APA PLENARY SESSION - Includes addresses by David Buss and Elizabeth Loftus

**Sunday, August 10, 2003**

9:00-10:50 AM, Metro Toronto Convention Centre, Meeting Room 802A

INVITED ADDRESS

**Micheal Perone** (W. Virginia Univ.). Errors and Deviations: Describing Variability in the Experimental Analysis of Behavior

Chair: **Carol Pilgrim**

10:00-11:50 AM, Metro Toronto Convention Centre, Meeting Room 201C

PAPER SESSION: Contingency Management Approaches to the Treatment of Addiction

Chair: **Christine E. Hughes**

Contingency Management Interventions in Community Settings. **Nancy M. Petry** (Univ. of Conn.)

Voucher-Based Incentives in the Treatment of Substance Abuse. **Sarah H. Heil** (Univ. of Vermont)

Establishing and Maintaining Employment in the Treatment of Drug Addiction. **Kenneth Silverman** (Johns Hopkins) Co-Author: **Conrad J. Wong**

12:00-12:50 PM, Metro Toronto Convention Centre, Meeting Room 802B

PAPER SESSION: Conceptual Issues in Behavior Analysis

Chair: **Kathryn J. Saunders**

Extrinsic Reinforcement Increases Intrinsic Motivation and Academic and Work Performance. **Stephen R. Flora** (Youngstown St. Univ.)

Is Behavior Analysis a Trait Psychology? **Stuart A. Vyse** (Conn. Coll.) **BA**

## DIVISION 25 ARCHIVE UPDATE

I am very pleased to announce that Amy Kathryn Drayton will be joining me in the Division 25 archive effort. Ms. Drayton, a graduate of North Dakota State University, is now a Doctoral Fellow in Eastern Michigan University's new Ph.D. program in clinical psychology. Amy and I will be working on several Division-related projects, including cataloging hundreds of pages of Division 25 documents, creating a complete collection of Division 25 Recorders, exploring the possibility of converting the Recorder collection to electronic form, and completing an article on the history of the Recorder. Amy's participation in the Archive effort is a professional development component of her doctoral fellowship, and is supported by Eastern Michigan University's Psychology Department (Kenneth Rusiniak, Head) and Eastern Michigan University.

We need your contributions. If you have Division-related materials to preserve in the Archives, especially photos (or copies of photos) of Division events and back issues of the Recorder, please contact us. We are now prepared to accept and preserve documents and photos in electronic form. We would like to also collect video and audio recordings of Division events.

James T. Todd

**For more information or to donate materials, contact:**

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# THE 2002 DON HAKE BASIC/APPLIED RESEARCH AWARD

JACK MICHAEL, Western Michigan University

My efforts to teach about behavior analysis occasionally have been hindered by what appears to me to be flaws in our existing technical terminology. In response, I have tried to improve the definitions, invented some new terms, and provided new conceptual analyses of some environment-behavior relations. It is professional writing of this sort that has possibly contributed to the goals of the Hake Award and, most recently, to the concept of the establishing operation. I will describe here this process of terminological refinement with the hope of encouraging similar efforts on the part of other teachers and researchers.

With respect to the establishing operation<sup>1</sup> or EO, my initial concern was the result of trying to use Skinner's treatment of motivation under the headings of deprivation/satiation and aversive stimulation, as in *Science and Human Behavior* (1953, pp. 141-159) and in *Verbal Behavior* (1957, pp. 31-33 and 35-51). An initial problem was that the term *deprivation*—denying an organism access to something—was not easily applied to some motivational relations. Salt ingestion for example, often mentioned as having the same effects as water deprivation, could not in any way be interpreted as either deprivation or aversive stimulation. I suppose a willingness to go inside the organism and say that salt ingestion has the *same physiological effects* as water deprivation could salvage *deprivation* as a general term, but a purely behavioral solution would be better.

What was needed was a term that was controlled by the motivational aspects of deprivation, aversive stimulation and any operation (like salt ingestion) that did not qualify as either deprivation or aversive stimulation. Skinner in *The Behavior of Organisms* (1938) and in *Science and Human Behavior* (1953),

and Keller and Schoenfeld in *The Principles of Psychology* (1950) identify two essential aspects of any motivational variable: (1) It alters the current reinforcing effectiveness of some event, object, or stimulus condition, and (2) it alters the current frequency of all behavior that has been reinforced by that event, object or stimulus condition. Keller and Schoenfeld named such motivational variables *establishing operations*, a good term in that it has a strong environmental implication and was neither in current nor technical behavioral usage (Michael, 1993, 2000).

Perhaps it would not be inappropriate to suggest **terminology principle #1:** Environment-behavior relations that are the same in essential features should have the same name—otherwise the general relation will be overlooked or not dealt with clearly. It seemed to me a significant improvement to refer to all events, operations, or conditions that had the two motivational effects listed above as establishing operations (EOs), irrespective of how they might differ in other respects. Food deprivation, particular forms of aversive stimulation, and salt ingestion may differ in many ways, but all qualify as EOs.

Closely related is **terminology principle #2:** If something is important and occurs often but does not have a name, then it likely is neglected or confused with a different things that do have names. Giving motivational variables a general name, linked to the two essential defining characteristics, seemed useful to me as a way to bring motivation back into behavior analysis from a condition of relative neglect starting in the 1970s. The Kantorian term, *setting event* (Bijou and Baer, 1966, pp. 778-784) includes the variables that Keller and Schoenfeld (1950) called establishing operations, but is clearly not confined to events that have only the two defining features described above. In any case, I found the EO terminology very helpful in my efforts to teach a comprehensive system of behavior principles, which were collectively exhaustive and mutually exclusive.

Even more important to me (currently not to the majority of applied behavior analysts making use of the EO concept) was the possibility of identifying and defining learned motivative relations, or in earlier terms, learned *drives*. At the beginning of Chapter 10 of *Verbal Behavior* Skinner explains how one could use the elementary verbal relations described in Chapters 3 and 4 (i.e., mand, echoic, textual, intraverbal, tact) to actually *control* a person's verbal behavior as contrasted with simply *describing* or *understanding* it. The hypothetical task is to induce a person to say *pencil* but under circumstances where we have agreed not to simply ask for the response. "To strengthen a mand of this form we could make sure that no pencil or writing instrument is available, then hand our subject a pad of paper appropriate to pencil sketching, and offer him a handsome reward for a recognizable picture of a cat (1957, p. 253).

In conventional terminology, the offer of the reward for the sketch is a discrimi-

native stimulus ( $S^D$ ) for making such a sketch and handing it in. Only in the presence of such offers (or similar conditions) has such behavior been reinforced with money (or some form of explicit reinforcement). But what about the role of the offer in causing (evoking) the request for the pencil? In this respect the offer is more like an EO. It made pencils an effective form of reinforcement (any behavior that obtained a pencil would presumably be increased in future frequency—would be operantly conditioned); but more importantly, it increased the current frequency (evoked) of all behavior that had been reinforced previously with obtaining a pencil, for example asking for one (manding). In terms of the two defining features it clearly qualifies as an EO, but why not as an  $S^D$ ?

What is needed now is a carefully stated definition of the  $S^D$ , which emphasizes the relation between the presence/absence of the stimulus, and the availability of some form of reinforcement for some type of behavior. Thus an  $S^D$  can be defined as a stimulus condition that evokes a type of behavior because in its presence that type of behavior has been reinforced and *in its absence that type of behavior has occurred and has not been reinforced*. In terms of reinforcer availability, it is a stimulus condition in the presence of which a type of reinforcement has been available and *in its absence unavailable*. From a molecular perspective, the immediate reinforcement for a request is obtaining what was requested. If this is accepted, the offer of the money fails to qualify as an  $S^D$  because a pencil for a request is just as available in the absence as in the presence of the offer of the reward. Under normal social conditions, requests for things like pencils have been granted irrespective of events related to the reason for the request. In the context of Skinner's hypothetical experiment, pencil borrowing often has occurred successfully, irrespective of what the pencil was going to be used for.

At this point **terminology principle #3** becomes relevant: Environment-behavior relations that are different in essential features should have different

names—otherwise their essential differences will be overlooked, which can lead to practical as well as conceptual errors. So, I proposed (Michael, 1993) that learned<sup>2</sup> variables that alter behavior by altering reinforcing effectiveness be called *conditioned establishing operations*<sup>3</sup> (CEO), and the term  $S^D$  be confined to those that alter behavior because of a differential relation to reinforcer availability.

Having made a more restrictive definition of the discriminative stimulus, I had to reconsider the role of the warning stimulus in avoidance procedures. For me, its status in causing the avoidance response has long been problematic because of problems with the status of the shock in its evocation of the escape response. I never easily have thought of the shock as an  $S^D$  for the escape response, but why not, and what should it be called? Well, it is clear that it qualifies as an establishing operation—it makes shock removal effective as reinforcement and evokes all behavior that has been so reinforced. But if the shock is an EO rather than an  $S^D$ , why is the warning stimulus not an  $S^D$  with respect to the avoidance response? It makes the warning stimulus termination effective as reinforcement and evokes all behavior (in particular the avoidance response) that has been so reinforced. Thus, it could be another learned establishing operation.

But back to the shock and the escape response. Maybe the shock qualifies as an EO, but why not as an  $S^D$ ? Another look at the essential conditions for the discriminative stimulus suggests a further restriction. It is a stimulus condition in the presence of which a type of response has been reinforced (which implies some EO with respect to some form of reinforcement) and in the absence of which the same type of response has occurred and not been reinforced. But this last feature requires that *the unavailable event would have been effective as reinforcement if it had been obtained*. That is the problem. When the shock is on, the response has been reinforced by shock termination. But when the shock is off, what is it that has been unavailable? Nothing. When the shock is off, there is no EO making shock

removal effective as reinforcement, and thus the shock fails to qualify as a discriminative stimulus because reinforcement unavailability is not in effect in shock absence. This argument applies in exactly the same way for the role of the warning stimulus in its evocation of the avoidance response.

This argument has not convinced a number of my colleagues in the area of conceptual analysis, but I believe that the type of conditioned establishing operation exemplified by the warning stimulus in avoidance is of increasing importance in dealing with instructional work with language delayed individuals, and conceptualizing it as a motivative rather than a discriminative relation will contribute to more effective education and treatment.

One final point: Respect for **principle #3** requires that we now consider whether the one term, *conditioned establishing operation* will be satisfactory for both of the learned motivative variables identified above. I thought not (Michael, 1993) because of their quite different functional characteristics. One alters the reinforcing effectiveness of some other event (like the offer of money for the sketch), and the other makes its own termination effective as reinforcement (the warning stimulus in avoidance) and so I called one a *transitive* and the other a *reflexive* CEO.

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<sup>1</sup> Recently what I think of as an improved arrangement of motivational concepts has been suggested by Laraway, Snyerski, Michael and Poling, 2003, with *motivative operations* replacing *establishing operations*.

<sup>2</sup> What is learned is the relation between the environmental variable and the altered effectiveness of something as a form of reinforcement (Michael, 1993). When the alteration in reinforcer effectiveness is unlearned, as with the relation between food deprivation and the effectiveness of food as reinforcement, the relation can be called an *unconditioned establishing operation*.

<sup>3</sup> In the 1982 paper, "Distinguishing between discriminative and motivational functions of stimuli" I suggested the term *establishing stimulus*, in an analogy to *discriminative stimulus*. However the contrast between unlearned and learned relations seemed better carried by *unconditioned establishing operation (UEO)* and *conditioned establishing operation (CEO)* which is current usage until the Laraway et al. paper mentioned in the earlier footnote becomes available. BA

had fun making "it" work. They set out to prove that Skinner's science was the basis for a powerful technology. Marian lived long enough to see a real revolution in animal training, therapies for the mentally disabled, and great inroads into classroom teaching.

Marian believed in synergy, that the whole can be more than just the sum of the parts. She was a team organizer and player because she knew she could accomplish more. One of the reasons that ABE was successful for almost half a century was that Marian knew how to get the most from her people. She urged those around her to pool their physical and intellectual resources and to raise their sights; she did not pursue mediocrity.

This memorial writes into the record the accomplishments of not just one person, Marian Breland Bailey, but of three persons, Marian and Keller Breland, and Grant Evans. I especially honor Marian's memory because she was very dear to me, but I honor all three because of what they did for me, for their family, for their friends and colleagues, and for their chosen professions.

Marian was my best friend, my colleague and my wife. While I would never question Marian's intellect, there was a time I questioned her sanity. When Marian agreed to marry me in 1976, my six children (three sets of twins ranging in age from 5 to 15) were living with me. For a second time, Marian went through the entire child rearing process of PTAs, classroom conferences, and, as before with her previous family, maintained her professional and academic life. Of course, my kids grew to love her dearly as their mother, and affectionately called her "Mouse."

Nearly every day I discovered something wonderful she had done in her past, either with Keller or Grant, or by herself. All the while she was by my side, she was doing new and wonderful things, and inspiring me to do likewise. Even today I continue to discover in Marian's papers accomplishments she never described to me: articles she wrote, behaviors she trained, experiments she had done, thoughts she had. Marian is the perfect example of those who do what they do quietly and compe-

tently. She is an example of professional achievement that did not come directly from the halls of academia. She inspired all around her to succeed, whether in business, in the classroom, or the training room. Marian believed in what she was doing. "Believe" was an important message to her students, to her staff, and to her colleagues.

I was fortunate to work side by side with Marian, Keller, and Grant. I learned far more about science, and how to do science, from these three than I ever got from a classroom or at scientific meetings. I learned more about how to live my life from Marian than from any other person. I am saddened that others can never know these three as I did. I am glad that I had the chance to know them as well as I do. I do "Believe."

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# ANNOUNCEMENTS

## APA Annual Convention, August 7-10,

**2003** The Convention is just around the corner – Are You Registered? Register today at [www.apa.org/convention](http://www.apa.org/convention). The World Health Organization announced today that it has taken Toronto off its list of SARS-affected areas. For more information go to the WHO website at ([www.who.int](http://www.who.int)) or the CDC website at ([www.cdc.gov](http://www.cdc.gov)). Join us in Toronto for...

Big name speakers such as Daniel Kahneman on Bounded Rationality; Stephen Ceci on Moving from Basic to Applied Research; Steven Hollon on Treating Depression with Drugs and Psychotherapy, David Buss on the Evolution of Desire, and Nora Newcombe on Sex Differences in Sociobiology.

Plus 1,140 sessions, 2,523 poster presentations and 165 exhibit booths including leading psychology publishers and professional resource providers.

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**Book your reduced hotel rates:** Book your reservations directly through ExpoExchange at (800) 424-5249.

**Discounted airfares are still available:** Contact United Airlines at 800-521-4041 (ID# 597BD) or Air Canada at 800-361-7585 (ID# CV030820). APA conference attendees receive the special meeting rate.

Special Services for APA Conference Attendees

To make your convention experience even more enjoyable, APA is providing these services:

- Cyber Café. Read and respond to email, as well as search for information during exhibit hall hours.
- Poster Sessions. Attend poster sessions inside the Exhibit Hall.
- Massage Break Lounge. Take a break from the convention and enjoy upper-body seated “chair” massages provided by certified massage therapists.



## The “Maple Leaf Ramble” - The 25th Annual Running Psychologists’ APA 5K “Ray” Race and Walk, Saturday, August 24, 2002, Presented by Division 47: Sport and Exercise Psychology.

The annual race and walk at the 2003 Toronto Convention of APA will be held on **Saturday** morning, August 9<sup>th</sup>, at 7AM. Final information on the venue for the race will appear in the APA Monitor on Psychology, the Division 47 web site ([www.psyc.unt.edu/apadiv47](http://www.psyc.unt.edu/apadiv47)), and in your convention packet. If you pre-register, you will be notified via email or post. Trophies will be awarded to the overall men and women’s winners and to the top three in each 5-year age group,

from under 25 to over 75. The top three male and female finishers who hold membership in Division 47 will receive awards. The top three finishers who are current Psi Chi members also will receive awards, as will the top three current or past Psi Chi National Council members. To honor the exhibitors at our meeting who provide excellent raffle prizes for us, a special award also will be given to the highest finishing male and female exhibitor. Pre-registration will run until August 1<sup>st</sup> - which means that the entry form and fee must be received by that date. Please give us all the requested information including age and gender so that the race numbers can be labeled appropriately and save us time in determining your category for the results. **THE ENTRY FEE FOR PRE-REGISTERED RUNNERS IS \$20.00**, which includes a commemorative shirt, raffle chance, and post-race refreshments. **PAST AUGUST 1<sup>ST</sup>, CONVENTION AND DAY-OF-RACE REGISTRATION FEE IS \$25.00**. Pre-registration for students is \$10.00 and convention/day-of-race student registration is \$14.00. **PLEASE** pre-register to help us avoid too many convention and day-of-race registrations. Make your check payable to: **Running Psychologists**. The 6th Annual Pre-Race Pasta Dinner will be held on Friday evening, August 8<sup>th</sup>, at 6:00 - 8:00 PM. Please mark your entry form to reserve a place at the party. You may prepay when you pick up your race materials at the convention. You may pick up your race number, shirt, and raffle ticket at the business meeting of Running Psychologists on Friday morning at 8AM (see the program for room number) or at the APA Division Services booth in the main Convention Area, beginning Thursday afternoon.



**A Division 25 Journal?** Are there research areas within behavior analysis that currently do not have sufficient publication opportunities? The Division 25 Executive Committee is interested in learning if members would like the Division to consider undertaking a Division 25 journal or other publication project. The recent termination of PsyScan BAT presents us with a funding base for a new project, should Division members deem it appropriate. While many journals welcome and feature the research of behavior analysts, each journal has its specific foci and audience.

1. If you believe that some types or topics of research need new publication opportunities, please contact David Eckerman ([david\\_eckerman@unc.edu](mailto:david_eckerman@unc.edu)) with a description.
2. While we are not recruiting manuscripts at this time, should sufficient interest is shown, a special issue of the Division 25 Recorder might be considered to provide a “trial issue” for a Divisional journal. If you would consider sending a manuscript for consideration, please send an email to David Eckerman indicating your topic and potential title. **BA**

# AMERICAN PSYCHOLOGICAL ASSOCIATION

## Division 25 for Behavior Analysis MEMBERSHIP APPLICATION FORM

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*I would like to join Division 25 of the American Psychological Association.*

\_\_\_\_\_ **Regular Member.** Must be a Member or Fellow of APA and then approved by the Division 25 Executive Committee. Upon acceptance, your Division 25 assessment (\$22.00) will be added to your APA dues next year.

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*Membership applications should be sent to Eric A. Jacobs, Ph.D., Division 25 Membership Chairperson,  
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