Contents

Note: Prior to Volume 16, Number 1 (Spring 2013) the Journal of Behaviorology went by the name of Behaviorology Today, which occasionally published fully peer-reviewed articles, explicitly so labeled. Beginning with Volume 15, Number 1, all new material receives full peer review. See the “Submission Guidelines” for details.

Editorial

The Emergence and Expansion of Behaviorology in the Companion Animal Behavior Technology Field
James O’Heare

Does Periodic Instant Messaging While Working Improve Productivity and Quality of work?
Angela Lebbon

Syllabus Directory*

A Look at Pharmacotherapy for Treatment of Severe Behavior Disturbances
Philip R. Johnson

Submission Guidelines

Editorial Review Board & Guest Reviewers / Back Issues & Donations

Visit www.behaviorology.org / Journal & Web Site Copyrights

TIBIA Memberships Costs & Criteria & Benefits

TIBIA Membership Cost Details (and Application Form)

TIBI / TIBIA Purposes

About Behaviorology, TIBI, and Journal of Behaviorology

Some TIBI Board Member Contacts

* This issue does not contain any tibi course syllabi. New syllabi, or updates of previous syllabi, may appear in future issues. (See the Syllabus Directory for details.)
The TIBI 27th Behaviorology Anniversary Convention produced a number of papers; three of these papers appear in this issue of the Journal of Behaviorology. I served as action editor for two of the papers; Stephen Ledoux graciously served as action editor for the third paper, which I authored. I would like to extend my thanks to Stephen for encouraging me to publish my paper and for wearing the hat of action editor while continuing to fulfill his managing editor duties for this issue of JoB (i.e., layout, production, and distribution).

In the first paper, entitled The Emergence and Expansion of Behaviorology in the Companion Animal Behavior Training Field, James O’Heare provides a historical review of the contributions of behaviorological science to the field of companion animal training. Dr. O’Heare traces this history from its origins in the 1940s, with the work of Marian and Keller Brelan and Bob Bailey, through the early twenty-first century, during which time the field has experienced the development of new schools and professional organizations that emphasize contingency management approaches over agentially-focused approaches.

The second article is entitled Does Periodic Instant Messaging While Working Improve Productivity and Quality of Work? In it Angela Lebbon discusses the results of her study that examined the effects of social networking activity in the workplace. Specifically, Dr. Lebbon’s study examined the effects of instant messaging on work-related behavior. Interestingly, the results of this study indicate that there is little difference at work between people who receive and respond to periodic instant messages versus those workers who do not receive instant messages.

In the third article, which I entitled A Look at Pharmacotherapy for Treatment of Severe Behavior Disturbances, I provide a brief history of the practice of pharmacotherapy. Then I discuss the benefits and pitfalls of treating behavioral problems pharmacologically, talk about pharmacologic treatment for several populations, and provide a brief overview of behaviorological treatment interventions for conditions that are commonly treated with medications. My paper concludes with a set of recommendations regarding the use of pharmacologic treatment for severe behavior disturbances.

On a different note, it has been a pleasure serving as editor for volumes 15, 16, and 17 of this journal. My tenure as editor (a) began just at the journal’s transition to becoming a fully peer-reviewed journal (as of the first issue of volume 15) and (b) included the TIBI-specified change in name from Behaviorology Today to the Journal of Behaviorology. For the past three years, I have had the good fortune to work with several talented reviewers from our Editorial Review Board (the TIBI Board of Directors) and our Guest Reviewers: Werner Matthijs, James O’Heare, and Susan Friedman. I would like to thank each of you for your time and assistance with reviewing articles that I sent your way as editor of JoB; I truly appreciate your contributions to the Journal. In addition, I want to single out, Stephen Ledoux, Lawrence Fraley, and John Ferreira for special thanks. The guidance, support, and encouragement that each of these individuals provided me is inestimable.

With that being said, it is now time for me to bow out as editor, and introduce James O’Heare as the new editor for volumes 18, 19, and 20 of JoB. Dr. O’Heare brings considerable experience and talent to the table (e.g., co-founder of the International Association of Animal Behavior Consultants, founder of the Association of Animal Behavior Professionals, and author of several books on behaviorological approaches to training animals, the most recent being O’Heare, 2014). I am sure that JoB will thrive under Dr. O’Heare’s capable editorship. Send him your letters to the editor, book reviews, and of course more articles that address issues relevant to the principles and practices of the discipline of behaviorology (see the Submission Guidelines on page 26).

Finally, I would like to remind everyone that the TIBI 28th Behaviorology Anniversary Convention has been scheduled for 5-7 June 2015 in Vancouver, BC. If you have suggestions, proposals, or questions regarding possible papers, posters, panel discussions, and so on, contact members Bruce Hamm or Katie Rinald, the Program and Site Coordinators, at Coast Behavior Analysts, 1019 Cambie Street, Vancouver BC V6B 5L7 (e-mail: katie@coastaba.ca or brucehamm@me.com). More information about the convention will appear on our website and in the next issue.

References

The Emergence and Expansion of Behaviorology in the Companion Animal Behavior Technology Field

James O’Heare*

Abstract: Due to the value of behaviorology as the appropriate natural science that informs the field of companion animal training, a historical review of the most prominent contributions of behaviorological science to the field is in order. Long before being called behaviorology, the natural science of behavior began making its impact on companion animal training almost as early as it began making an impact in human behavior. In the early to mid 1940s, Marian and Keller Breland, and later Bob Bailey, were applying B. F. Skinner’s new natural science of behavior to nonhumans. After a slow start, the 1980s saw an explosion of popularity in applying the operant conditioning approach, enhancing added reinforcement, for training companion animals, an application pioneered by Karen Pryor and Ian Dunbar. The 1990s saw another revitalization with the work of Jean Donaldson. At the start of the twenty-first century, new professional associations and schools were forming, and these supported a less agential approach with less ethology and pathology, and more contingency management. Around this time, popularity in behavior science began to grow with contributions from Susan Friedman and Mary Burch. Currently, one school and one professional association are completely behaviorological in focus.

Foundations

In the early 1940s, B. F. Skinner explicated the radical behaviorist philosophy of science and the basic science and technology that it informed. At that time, dog training was mainly punitive and geared toward working dogs rather than companion animals. Edward Thorndike was developing a behaviorism focused solely on consequence–maintained behavior, and Ivan Pavlov was developing a respondent model of behavior (Moore, 2008). Skinner’s radical behaviorism, in contrast, recognized both forms of behavior and conditioning. The natural science community now refers to the independent natural science of behavior–controlling relations, and the radical behaviorist philosophy of science on which it is based, as behaviorology (see Ledoux, 2012a, 2012b.)

In the mid 1940s, Skinner, Marian Breland, and Keller Breland applied these newly elucidated principles of what was then called “operant psychology” to train pigeons for potential war missions in World War II (e.g., see Bailey, 2013; Skinner, 1960/1999). This was a time period during which the early natural scientists of behavior still shared their academic homes with psychologists. In 1943 Marion Breland began training animals for commercials and animal shows. By 1947 the Brelsands’ company, Animal Behavior Enterprises, published a paper (1951) that elaborated on the application of operant conditioning principles to nonhuman animals. Perhaps the Brelsands are best known for their 1961 publication of a paper entitled “The misbehavior of organisms,” in which they emphasized the importance of species–typical behavior patterns and tendencies, and the intrusion of phylogeny into ontogeny.

The Brelsands began working with Bob Bailey, a zoologist from the University of California at Los Angeles and the Navy’s Director of Training, on a project called Dolphins at Sea. After Keller Breland’s death in 1965, Marion Breland and Bob Bailey maintained Animal Behavior Enterprises, and in 1976, they were married (Burch & Bailey, 1999). They retired Animal Behavior Enterprises in 1990. In 1995 the Bailey’s began providing training classes in operant conditioning with chickens

*Address correspondence regarding this article to jamesoheare@gmail.com.

Key words: added reinforcement, behaviorology, companion animal, dog, history, natural science, training, behaviorology
that has generally been referred to as “chicken camp.” Marion Breland Bailey died in 2001, and Bob Bailey continues to provide the chicken camps (Bailey, 2013).

Contemporary Animal Trainers and the “Positive” Reinforcement Movement

In 1981 Ian Dunbar, a veterinarian and pioneer in added reinforcement–based dog training, opened *Sirius Puppy Training* in Berkeley, California, the first dog training classes designed specifically for puppies, and utilizing prompts and added reinforcement consequences rather than coercion (Dunbar, 1996). In a sense, Dunbar’s 1981 book, *How to Teach a New Dog Old Tricks*, began a trend toward more added reinforcement–based methods. (Previously called “positive” reinforcement, the switch to the less confusing “added” reinforcement first appeared in print in 1997; see Ledoux, 1997; also see Ledoux, 2014, pp. 147–160.)

That trend grew in popularity, particularly with other pioneering trainers such as Karen Pryor, whose 1984 book *Don’t Shoot the Dog*, paved the way for Jean Donaldson’s 1996 book, *The Culture Clash*, which caused an explosion of popularity in their added reinforcement–based training methods. Earlier, when Dunbar’s 1981 book appeared, general audiences still saw the principles of behavior as derived from the “learning theory” of psychology; however, even by the time of Pryor’s 1984 book, these principles of behavior were increasingly acknowledged as deriving from the natural science of behavior, at that time typically called behavior analysis. The fact that this natural science of behavior was not appropriately called part of psychology remained unclear until the end of the 1980s (see Fraley & Ledoux, 2002, for a detailed discussion of this transition).

Karen Pryor’s 1984 book enhanced the trend toward added reinforcement–based training, and led to a popular and still growing movement commonly known as *clicker training*. Cast in the vernacular, this training makes a minimum of technical details accessible for successful applications to companion animal training, especially for companion animal guardians. However, this success comes at the price of allowing the agentialism inherent in the vernacular to go unchallenged. Such a price undermines the scientific analysis upon which the success is based. To avoid this the companion animal training field needs better education about the underlying natural science in practitioner training. This trend is happening, as we will see.

The roots of *clicker training* can be found at least as early as the 1950s. For example, in 1951 Skinner published the article, “How to teach animals,” in *Scientific American* (Skinner, 1951/1999) which explicitly refers to a “cricket,” which was the name of the toy clickers of the time. Currently many *clicker training* manuals are available (for starters, see Pryor, 1999, 2001).

Publication of *How Dogs Learn* by Mary Burch and Jon Bailey in 1999 was another milestone since this was the most behavioral publication to date. While the authors had for some time already shed the “learning theory” of psychology, this book still introduced the principles and practices that it covered as thoroughly deriving from the then current discipline of behavior analysis. This was far more systematic and clear than the older melding of “operant psychology” with dog training folk wisdom. It demonstrated that there could be a science of behavior rather than simply a folk wisdom approach to training.

Murray Sidman’s book *Coercion and its Fallout* (2001) was also an important influence at this time on the added reinforcement movement. This book carefully detailed the dangers inherent in aversive control across all levels of interaction throughout society. These levels cover from companion animal behavior, through interpersonal relations, child rearing, education, business and industrial and organizational relations, and so on, to the behavior of international relations. The point for us is the risks of escape, avoidance, and countercoercion that occur when coercion and punishment are part of animal training.

In 1999 Eddie Fernandez founded the University of North Texas *Organization for Reinforcement Contingencies with Animals* (ORCA) which was focused on zoo animals, but its online forum called *Animal Reinforcement Forum* (ARF) was popular among dog trainers, and contributed to a more behavior–analytic perspective on animal training at the time.

Academic Programs of Study Involving Principles of Operant Conditioning

In the mid 1990s, Jean Donaldson opened the *Academy of Dog Trainers* through the San Francisco spca. This was a six–week intensive dog trainer development course using added reinforcement–based methods. The Academy of Dog Trainers is now separate from the spca and provides a much more in–depth program of study (see www.academyfordogtrainers.com).

In 1999 the author opened the *Companion Animal Sciences Institute* (CAS; see www.CASInstitute.com). This two–year intensive distance study program involves training in academic and hands–on animal training repertoires focusing on added reinforcement–based methods. The program gradually shifted to a more behavior analytic, and eventually a behavioriological, orientation. Since then, numerous schools have opened their doors to promote added reinforcement methods in animal training, including *The Karen Pryor Academy*.
(see www.karenpryoracademy.com), Pat Miller’s Peaceable Paws (see www.peaceablepaws.com) and, most notably, Susan G. Friedman’s Behavior Works (see www.behaviorworks.org).

Professor Friedman is among a number of other behaviorally oriented professionals that have begun to participate in the field. As a professor teaching out of Utah State University, Logan, she began teaching a behavior analytic telecourse (i.e., online and offline as well as teleconferencing) called Living and Learning with Parrots in 2001 and, in 2007, she began providing a course called Living and Learning with Animals for a professional audience, through her company Behavior Works (Friedman, personal communication, 10 October 2013).

Even earlier, Stephen F. Ledoux, a professor of behaviorology, began in 1998 teaching a dozen basic natural science and application courses in behaviorology explicitly, including a course in non–coercive companion animal behavior training, at the State University of New York at Canton as well as through The International Behaviorology Institute (TIBI, at www.behaviorology.org).

Professional Associations and Certifying Bodies

In 1993 Ian Dunbar founded the first professional association for dog trainers—the Association of Pet Dog Trainers, which later underwent a name change to the Association of Professional Dog Trainers (APDT; see www.apdt.com). The APDT functions solely as a professional association and does not certify members.

In 2001 the Certification Council for Professional Dog Trainers (CCPDT; see www.ccpdt.org) began providing certification based partly on invigilated exams. The CCPDT has recently expanded to certifying behavior consultants as well as trainers.

In 2004 Lynn Hoover and the author co–founded the International Association of Animal Behavior Consultants (IAABC; see www.iaabc.org) to expand professional organization effort into resolving problem behaviors, and into other species, as well as to vanguard an added reinforcement–based dedication. The IAABC provides certification in dog, cat, and parrot behavior consulting. Many consider the IAABC to be the premier professional association globally.

In 2006 the author founded the more niche Association of Animal Behavior Professionals (AABP; see www.AssociationofAnimalBehaviorProfessionals.com) in order to promote specifically a strong dedication to added reinforcement–based methods and the systematic application of behaviorological principles rather than the then dominant medical model and ethology–oriented approaches. The AABP provides certification for dog trainers and dog, cat, and parrot behavior technologists.

Behaviorology Per Se

Currently, the author may be the only animal behavior technologist operating under the behaviorology label although there are behavior analysts with a strong natural science orientation working in the animal behavior field under that label. Behaviorology is distinguished from behavior analysis both by being a name (for the natural science of behavior) that lacks any historical connection to psychology, and by being a full discipline, completely separate from, and independent of, psychology organizationally as well as philosophically. However, again, just as in human focused fields, there are behavior analytic professionals, such as Susan G. Friedman, operating from a strongly natural science orientation, who could operate under the behaviorology label were contingencies to provide the requisite evocative stimuli.

As a training program for animal training professionals, CASI instructs from a behaviorology orientation, introducing the discipline to dozens of new trainers and behavior technologists each year, and Behavior Works continues to generate interest in a natural science approach to behavior under the behavior analysis label. These trainers work from the increasing number of books that are specifically behaviorological, including these current titles: General Behaviorology: The Natural Science of Human Behavior (Fraley, 2008), Running Out of Time—Introducing Behaviorology to Help Solve Global Problems. (Ledoux, 2014), The Science and Technology of Dog Training (O’Heare, 2014a), Changing Problem Behavior Second Edition (O’Heare, 2014b), and The Science and Technology of Animal Training (O’Heare, 2014c). To support successful study, most of these titles have a companion book of study questions.

The use of those books introduces many more people to the discipline of behaviorology in ways that support all applied behavior fields and the dissemination of the principles derived from a natural science of behavior. On that basis, the addition of behaviorology to the companion animal behavior training field provides the foundation for a bright future in this field.5

References


Does Periodic Instant Messaging While Working Improve Productivity and Quality of Work?

Angela Lebbon*

Lehman College CUNY

Abstract: Technology has lead to the emergence of online social networking wherein individuals communicate with one another in real time. While technology has improved individuals’ ability to communicate and exchange information quickly, there is a growing divide on the perceived side effects of this behavior in the workplace. Some view such behavior as necessary and beneficial, while others view it as nothing more than interruptions impeding productive employees. However, little exists in the research literature examining real–time interruptions with repeated behavioral measures. This study examined the effects of instant messaging on individuals’ work-related behavior within a 35–minute session. Overall, data suggest little performance difference between those who received periodic instant messages versus those who did not. Future researchers should examine the effects of real–time communication interruptions with a variety of job tasks over the course of weeks and months.

Introduction

Rapid growth of technology has lead to the emergence of online social networking wherein individuals communicate with one another in real time. Social networking runs on software applications from the Internet and involves exchanging instant messages (IM) or text messages via computers and cell phones. Such social networking applications include, but are not limited to, Facebook, Twitter, Skype, WhatsApp, and iMessage. It is estimated that IMing, along with email and telephone use, accounts for 28% of an individual’s workday and costs corporations nearly $600 billion annually (Spira & Feintuch, 2005). A recent survey found that 75% of North American employees engage in social networking at least once a day, with 60% accessing their social networks via cell phones (SilkRoad Technology, 2012). If greater and greater numbers of employees are accessing the Internet and social networks through their cell phones, it becomes more difficult for employers to track and prevent such behavior. To date, little data exists demonstrating a significant, negative impact of social networking on workplace performance. It is possible that such behavior is not as detrimental as suspected, and therefore, employer attempts to curb such behavior may merely be a waste of time and finances, not to mention negatively affecting trust and relations between employer and employee.

Antecedents and Consequences for Instant Messaging

Researchers have long suspected that employees’ workplace leisure behavior and non–work–related Internet use is due to low levels of work motivation (e.g., Twenge et al., 2010; Coker, 2011). (Motivation, as defined by behaviorologists, occurs when a motivating operation is present in the environment, which increases the likelihood of engaging in behaviors that have lead to consequences in the past [Miguel, 2013].) Researchers have followed up such speculation and begun investigating the relationship between motivation and social networking. Survey research has found that employees engage in social networking as one of their top non–work–related activities; however, a lack of motivation serving as the antecedent is suspect (SilkRoad Technology, 2012). More specifically, almost 50% of workers report using social networking during work to interact with their colleagues, 47% report using social networking to interact with friends, and 44% use it for customer relations (SilkRoad Technology). A number of researchers have noted a variety of antecedents and

*Direct inquiries to Angela R. Lebbon, Dept. of Economics and Business, Lehman College, 250 Bedford Park Blvd. West, Carman Hall 382, Bronx, NY 10468, USA (e–mail: angela.lebbon@lehman.cuny.edu).

Acknowledgements: Support for this project was provided by a PSC–CUNY Award, jointly funded by The Professional Staff Congress and The City University of New York.

Key words: social networking, instant messaging, technology, work behavior
consequences that include, but are not limited to, (a) a lack of workload prompts, summarized by the verbal shortcut “boredom,” (b) prompted by an incoming message, (c) maintain connections, (d) easier than conversing via phone or in-person, (e) counter–productive behavior such as wasting time in order to punish your boss or company after a negative interaction, and (f) reinforcement history (Garrett & Danziger, 2008; Lebbon & Hurley, 2013; Lim, 2002; Zhang, 2004).

With regard to one’s reinforcement history, a review of verbal behavior as defined by behaviorists, and the contingencies of verbal behavior, is necessary. Verbal behavior is seen by many “as among the most, if not the most, complex, omnipresent, vital phenomena of our world” (Ledoux, 2014, p. 439) and consists of spoken, written, and non–vocal behavior such as sign–language. “Verbal behavior is behavior that (as a real stimulus event) evokes another organism’s responses that mediate— as in provide—the reinforcers for the first organism’s behavior, after verbal–community contingencies have conditioned such mediating behavior” (p. 443). That is, the listener (or receiver of the communication) serves as the mediator in the conversation by reinforcing the speaker’s verbal behavior by receiving the information and providing a response. As Ledoux (2014) notes, verbal behavior does not occur without an audience, given the contingencies and reinforcement history that have been established by the speaker’s verbal community. Instant messaging, a type of verbal behavior, can be explained as a function of the contingencies and reinforcement history established by an individual’s verbal community. For example, when an individual sends you an IM, that IM functions as an evocative stimulus prompting your response. You respond knowing that you will encounter immediate reinforcement in the form of gaining access to another person, and the information the other is supplying you, based on your history with IMing others. (The “knowing” is an evoked neutral behavior and, since the inner agent “you” is scientifically irrelevant, the word “you” in these discussions merely provides a conveniently familiar phrasing.) More specifically, when the sender receives an IM response from the receiver, immediate reinforcement is delivered, thus increasing the likelihood of IMing in the future for both the sender and receiver. Furthermore, IMs are delivered, read, and responded to at a higher rate than emails. Additionally, IMing take less time and effort for frequent IMers than conversations on the phone or in person, which contributes to increasing the likelihood of this communication method occurring in the future. In more explicit detail, Ledoux (2014) notes the complexities of operant behavior, such as verbal behavior, with the following:

A wide range of such antecedent stimuli are usually present at any given time. Due to past conditioning, and either in a kind of competition, or sometimes singly but more often in combination, some among these stimuli evoke further behavior based on current neural structure derived from species and personal conditioning history. Additional stimuli may then conseque this behavior, altering the neural structures that mediate it and thereby changing how readily future similar situations will evoke it (p. 12).

Another consideration with social networking involves the communication devices: cell phones and computers. For a large number of individuals, especially those in certain industry sectors (e.g., sales, real estate, consulting, media) these devices are left on all day, because that is how their work is completed (in the case of computer users), or because clients (in addition to family members) need to reach the worker for important, immediate matters (in the case of cell phone users). Since these devices are rarely turned off, there is greater likelihood of being interrupted with a message. Every time a message is received, a sound or vibrate alerts the worker to its arrival. Given the individuals’ long reinforcement history with information immediately exchanged, the probability of attending to the message is high after the arrival sound or vibrate. Furthermore, sometimes the arrival of messages, or the messages themselves, function as aversive stimuli that produce ignoring or disconnecting from technology. At other times the environment either disallows responding or would consequate responding with aversive stimuli (e.g., when in a meeting with the boss or when in a movie theater where the answering behavior is also punished); in these instances, it is possible, albeit rare, that an important message is missed. For example, an emergency message about a family member’s health or a friend inviting you to an event or a boss’ repeated requests to follow–up on a work issue. Missing important information like these is typically aversive and/or results in a punitive response from the sender since the sender did not immediately receive a response according to their reinforcement history (and therefore, their sending behavior was placed on extinction); these are interactions and consequences that most individuals attempt to avoid in the future. Additionally, since these important, missed messages are rare, an intermittent schedule of consequences is in place, further strengthening the individual’s IMing behavior, including increasing the frequency with which the individual checks for arrived messages, and decreasing the duration between receiving and responding to messages.

Previous Research

Research has examined employees’ propensity for engaging in workplace leisure behavior and appears
to demonstrate that such behavior negatively impacts productivity and ability to reengage in work tasks (Bailey & Iqbal, 2008; Monk, Trafton, & Boehm–Davis, 2008). However, recent survey research suggests that employees who use the Internet and social networks are 9% more productive than those who do not, as long as Internet use and networking are below 12% of their workday (Coker, 2011). Behavioral research appears to support these survey findings, demonstrating that workplace leisure behavior negatively affected six participants’ work performance when leisure was more than 40% of their work time, yet was potentially beneficial when leisure was less than 15% of their work time (Lebbon & Hurley, 2013). Another behavioral examination measured the effects of IMing on nine participants’ ability to search websites and make selections; an analysis of the results revealed that one IM exchange increased completion time and impeded re–engagement with the experimental task (Czerwinski, Cutrell, & Horvitz, 2000). Limitations of research examining workplace Internet leisure include measuring behavior via surveys (e.g., Garrett & Danziger, 2008; Junco & Cotton, 2011; Ou et al., 2010) and analysis of pupil dilation and non–work–related cognitive responses (e.g., Bailey & Iqbal, 2008; Monk, Trafton, & Boehm–Davis, 2008), in addition to examining the effects by utilizing dummy variables in statistical analyses (e.g., Coker, 2011). Given that social networking websites seem to be costing companies $260 million a day in lost productivity (Facebook costs, 2007), or an overall cost of $759 billion a year from all workplace leisure behavior (Malachowski, 2005), the need to examine the effects of social networking on work–related behavior with repeated behavioral measures, with a larger sample size, appears serious.

**ABA Research on Social Networking**

While the two areas of applied behaviorology that are most relevant to these concerns, Applied Behavior Analysis (ABA) and, more specifically, Organizational Behavior Management (OBM) have not provided great attention to this growing expansion of technology with respect to work behavior, a great percentage of the research being published by OBM researchers uses technology as a means for delivering feedback and/or the components of an intervention. Yet, few studies examine the impact of technology *itself* on work behavior. A literature review of the *Journal of Organizational Behavior Management* over the last 20 years (1994–2013) via PsychINFO found 36 studies that involved computers or technology (e.g., wireless scanners, electronic monitoring devices, automated observation and feedback systems). (Appendix A provides some major characteristics and reference information for each of these studies.) Of those 36 studies, 24 involved the use of a computer and 13 involved the use of technology. It should be noted that some of those 13 studies on technology overlap the 24 studies on computer use; that is, they are duplicate studies within the search results. Of the 13 studies located that used technology, ten studies used technology as a means to deliver feedback or the intervention. Two studies used technology to complete the experimental task but researchers did not examine the impact of technology on the dependent variables. Of the 24 studies located that used a computer, 13 studies involved a computer task, six studies used the computer as a means to deliver feedback/intervention, five studies examined computer–based instruction, and seven studies examined computer applications as part of participants’ job responsibility (i.e., airport baggage screeners, scanning items in a warehouse). Lastly, a search of the following keywords in *Journal of Organizational Behavior Management* returned zero results: social media, social networking, cell phone, instant message, text message, Facebook, Skype, email, interruptions, and multitasking. Given the lack of behavioral research examining the effects of technology, computers, and social networking on work–related behavior, and given the prevalence of such behavior in the workplace, behaviorologists and the OBM community have great opportunity, and necessity, for conducting such analyses.

**Purpose of Current Study**

This study examined the effects of instant messaging on individuals’ work–related behavior within session. More specifically, this analysis examined the cumulative effect of interruptions on performance over time and the time participants took to disengage from social networking and re–engage with their work–related task.

**Method**

**Participants and Experimental Task**

Thirty–eight individuals enrolled in business courses at a northeastern college in the USA served as the participants for this study. Participants were told they would receive $25 for duplicating and typing a document into Microsoft Word® for one 35–minute session, in addition to completing a body discomfort survey after typing the document, which masked the true purpose of the study. Participants typed at a computer workstation in a 15–foot by 10–foot experimental room furnished to simulate an office setting. The Institutional Review Board, Lehman College, City University of New York, granted approval for this study.

**Experimental Design**

This study employed a between–group design wherein one group received IMs while the other group
served as the control group. Blocked randomization was used for group assignment to ensure an equal number of participants were assigned to each group. This study contained 19 participants in each group, IM group versus No–IM group.

**Independent Variables**

The independent variable was instant messages sent by the experimenter in five–minute intervals for a total of six IM exchanges during the session. Each IM exchange involved three back–and–forth instant messages between the experimenter and the participant. Each three–part IM exchange began with the experimenter asking the participant a simple, mathematical question (or a casual, personal question) and receiving the participant's answer (i.e., back–and–forth IM #1); the experimenter would then send another question and receive the participant's answer (back–and–forth IM #2) followed by the experimenter sending the third question and receiving the answer (back–and–forth IM #3). After the third back–and–forth IM, the participant would return to the experimental task. Examples of IM questions included questions like these: (a) (mathematical) What is 19+19? What is 36+39? and (b) (personal) What time did you wake up today? What is your favorite animal? Participants were delivered the same questions; however, the order of the questions was randomized. The experimenter delivered the IMs from a neighboring room.

**Dependent Variables**

The dependent variables were (a) number of words typed, (b) number of spelling errors typed, (c) number of errors corrected, (d) number of words omitted from the original document, (e) number of words added that were not part of the original document, and (f) time spent on–task. Words, errors, corrections, and time on–task were recorded in ten–second intervals by a Visual Basic Editor macro embedded in the Microsoft Word® file. The number of omitted and added words were recorded by trained research assistants who compared the original document supplied by the experimenter to each participant's typed document. Lastly, a percentage of IMing within a session was calculated for the IM group only. Percentage of IMing was recorded by the Visual Basic Editor macro and a computer software program (System Surveillance Pro), which provided keystroke logs with timestamps for IMing and typing.

Lastly, the average number of words typed by the IM group according to the percentage of time spent IMing within the experimental session was examined. Participants were grouped according to the following percentages: a) 7%–9% IMing—seven participants, b) 10–12% IMing—six participants, and c) greater than 13% IMing—six participants. Participants were allowed to take as much time as they wanted to think and respond to each IM, and therefore, the amount of time spent IMing the experimenter is not the same duration across all participants. This allowed for an analysis on how total percentage of IMing affects productivity within a session, and its cumulative effects.

**Inter–Observer Agreement**

Inter–observer agreement (IOA) data collected on the dependent variables were calculated for agreements on words omitted and added. Two independent observers recorded omitted and added words for 100% of the sessions (i.e., 38 of 38 total sessions). Overall, IOA agreements were 92.47% for the No–IM group and 89.3% for the IM group, range 77.19%–100%. IOA data were not collected on words, errors, corrections, or time on–task since those dependent variables were recorded by the macro. However, the macro was tested periodically to ensure it was functioning correctly and recording accurately.

**Results**

Data were graphed in one–minute intervals within five–minute blocks, across the 35–minute session, aggregated for each group. In general, there were no consistent differences between the groups for all dependent variables. Figures 1–6 provide a graphic representation of each dependent variable for both groups.

In Figure 1, the number of words typed by the IM group was slightly less than the No–IM group, most noticeably immediately following the delivery of the IM when participants were locating where their work was interrupted in order to resume typing, which is also reflected in Figure 2’s demonstration of seconds spent on–task.

Figure 3 shows data path separation between the two groups for spelling errors, however, the data are highly variable. The data appear to show that as time passed in the session, the No–IM group's errors decline, overall, in comparison to the IM group's errors. Figure 4 demonstrates that overall, there is no consistent difference between the groups for number of corrections.

For Figures 5 and 6, data were graphed in five–minute intervals, across the 35–minute session, aggregated for each group. For the IM group, answering IMs does not appear to have negatively affected the number of words omitted and added over the course of the session. IM breaks seem to have reduced the number of words added as the session progressed, decreasing from about 70 added words to about 30 added words by the end of the session (see Figure 6). Furthermore, the No–IM group appeared to have an increase in the number of words omitted toward the end of the session compared to the beginning of the session, and omitted 89 more words than the IM group during the last two five–minute intervals—
Figure 1. The aggregate number of words typed for the IM group and the No–IM group within one experimental session, across 35 minutes.

Figure 2. The aggregate number of seconds spent on–task for the IM group and the No–IM group within one experimental session, across 35 minutes.

Figure 3. The aggregate number of spelling errors typed for the IM group and the No–IM group within one experimental session, across 35 minutes.
Figure 4. The aggregate number of corrections for the IM group and the No–IM group within one experimental session, across 35 minutes.

Figure 5. The aggregate number of words omitted for the IM group and the No–IM group within one experimental session, across 35 minutes.

Figure 6. The aggregate number of words added for the IM group and the No–IM group within one experimental session, across 35 minutes.

Figure 7 is a graphic representation of the average number of words typed by the IM group, separated by the percentage of time spent IMing the experimenter. Participants who engaged in IMing 7–9% of the session had the highest average number of words typed, in comparison to those participants who IMed 10–12% and greater than 13% of the session. Interestingly, those who IMed between 10–12% and greater than 13% did not demonstrate great differences in the average words typed, often showing data path interaction.

Lastly, on average, it took participants a quarter of the IM time to disengage from IMing and re–engage with the experimental task. That is, participants averaged four–minutes per IM and averaged more than one minute to locate where they left off within the experimental task and return to typing the document. When these data were separated based on the

an indication that concentration may have decreased over the course of the session due to the absence of IM breaks (see Figure 5).

That is, participants averaged four–minutes per IM and averaged more than one minute to locate where they left off within the experimental task and return to typing the document. When these data were separated based on the
total percentage of IMing within the experimental session, it appears that a lower percentage of IMing resulted in a greater percentage of time to get back on–task with the experimental task. More specifically, participants who IMed 7–9% of the session took, on average, more than a third of the total IMing time (range: 19%–59%) to get back on task. Participants who IMed 10–12% of the session and greater than 13% of the session took, on average, a quarter of the total IMing time (range: 11%–46% and 4%–33%) to get back on task. Unfortunately, these data are somewhat variable and not consistent across participants, and therefore, a pattern was not found.

Discussion

Overall, it appears that IMing while working is not so detrimental to individuals when those individuals are engaged in simple work–related behavior. However, it also appears that IMing is not as beneficial as suggested by survey research. The most notable difference between the groups was immediately following the IMs when participants where off–task and attempting to locate their place within the original document to continue typing. However, participants were generally back on–task within the minute. Furthermore, the No–IM group did not appear to be negatively affected from not engaging in breaks, which is in conflict with researchers speculating that breaks are needed to prevent a decline in workers’ concentration (e.g., Coker, 2011) although, the No–IM group did appear to demonstrate a decline in the quality of their work with words omitted, possibly supporting Coker’s (2011) claim that individuals do need a break to restore their concentration.

One of the key limitations of this study is the short duration of examination. That is, in order to conduct the analysis with a larger sample size, conducting repeated measures over days, across each participant was not possible. This limitation could mean that participants were still demonstrating reactivity to the experimental procedure, as previous researchers have demonstrated that the dissipation of reactivity can take time and can be highly variable across participants (Lebbon & Austin, 2013). Future researchers could improve on this line of research by examining the effects of instant messaging over the course of days, weeks, and months on individuals’ work–related behavior. Furthermore, this research could benefit from examining the effects of instant messages with various job types. It is possible that the effects of instant message are more disruptive with behaviors that require critical thinking and high levels of concentration (such as technical writing, accounting and finance, or precise measurement of materials). Lastly, researchers should analyze how employers can take control of technology (work–related and non–work–related social media, instant messaging, Internet use with computers and cell phones) and leverage it as a reinforcer to increase productivity, especially since technology is becoming more intertwined in our work and personal lives.

Conclusion

This study is the start of behaviorologists and OBM–ers conducting analyses on the effects of technology on work behavior, when technology is not used as the intervening mechanism for feedback or goal setting. Data from this analysis appears to show that social networking is not as beneficial, or detrimental, to work–related behavior as previous researchers have speculated and found. The key for future researchers now becomes piecing apart the percentage of leisure time that is detrimental
and/or beneficial for workers, depending on their job classification. It would also be imperative for researchers to begin analyzing the varying effects that technology and social media have on performance, depending on generation classification. That is, one would assume that Generation Z–ers (individuals born between mid 1990 to the mid 2000) would be less affected by technological interruptions than Generation Y–ers (born between 1980–1990) and Generations X–ers (born between 1960–1980), given technological exposure at an earlier age. Research has shown that our brains are changing due to greater exposure to technology, in terms of amount and types of technology. For example, neuroscientists found Internet searches increased brain activity in areas associated with language, memory, and visual skills through fMRI measures, and these changes were more pronounced for experienced Internet users (Small et al., 2009). Additionally, Sparrow, Liu, and Wegner (2011) found through four studies on Internet use that “processes of human memory are adapting … growing into interconnected systems that remember less by knowing information than by knowing where the information can be found” (p. 778). Therefore, individuals and corporations would benefit from research examining the relationship between technological exposure over one’s lifetime and one’s ability to manage social media interruptions effectively.

**References**


### Appendix A

**Literature review of the *Journal of Organizational Behavior Management* from 1994-2013**

<table>
<thead>
<tr>
<th>Study</th>
<th>Compt.</th>
<th>Tech.</th>
<th>Task</th>
<th>Deliver feedback</th>
<th>Instruction/Training</th>
<th>On-the-job application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravina, N.E., et al. (2013). 33(1), 68-76.</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goomas, D.T. (2012). 32(3), 242-252.</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Goomas, D.T. (2012). 32(2), 131-139.</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tammemagi, T., O’Hora, D., &amp; Maglieri, K.A. (2013). 33(1), 31-54.</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hogan, L.C., Bell, M., &amp; Olson, R. (2009). 29(1), 6-18.</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fante, R., et al. (2010). 30(4), 325-338.</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Karlsson, T., &amp; Chase, P.N. (1996). 16(1), 27-44.</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moon, K., &amp; Oah, S. (2013). 33(2), 152-162.</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yu, E., et al. (2013). 33(2), 104-127.</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loughrey, T., et al. (2013). 33(3), 200-208.</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Fagerstrøm, A. (2010). 30(2), 199-220.</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[Complete reference details of the studies listed in Appendix A are included after the appendix in the version of this paper that appears on the www.behaviorology.org “journal/published issues” page.]
**Appendix A**  
**Literature review of the *Journal of Organizational Behavior Management* from 1994-2013**

<table>
<thead>
<tr>
<th>Study</th>
<th>Compt.</th>
<th>Tech.</th>
<th>Task</th>
<th>Deliver feedback</th>
<th>Instruction/Training</th>
<th>On-the-job application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goomas, D.T. (2012). The impact of wireless technology on loading trucks at an auto parts distribution center. <em>32</em> (3), 242-252.</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goomas, D.T. (2012). The impact of wireless technology on order selection audits at an auto-parts distribution center. <em>32</em> (2), 131-139.</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tammemagi, T., O’Hora, D., &amp; Maglieri, K.A. (2013). The effects of a goal setting intervention on productivity and persistence in an analogue work task. <em>33</em> (1), 31-54.</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Goomas, D.T. (2010). Replacing voice input with technology that provided immediate visual and audio feedback to reduce employee errors. 30 (1), 26-37.


Syllabus Directory

The most recent issue of *Journal of Behaviorology* that features a syllabus directory contains these two lists of current syllabi. These lists show where to find the most up-to-date versions (in title and content) of TIBI’s current course syllabi. The first list organizes the syllabi by the chronological volume and number where you can find each one (with volumes 5 through 15 under the name *Behaviorology Today*). The second list organizes the syllabi by numerical course number.

**Current Syllabi by Volume & Number**

Volume 7, Number 2 (Fall 2004): BEHG 101: *Introduction to Behaviorology I.*
Volume 7, Number 2 (Fall 2004): BEHG 102: *Introduction to Behaviorology II.*
Volume 7, Number 2 (Fall 2004): BEHG 355: *Verbal Behavior I.*
Volume 8, Number 1 (Spring 2005): BEHG 400: *Behavioriological Rehabilitation.*
Volume 8, Number 1 (Spring 2005): BEHG 415: *Basic Autism Intervention Methods.*
Volume 8, Number 1 (Spring 2005): BEHG 420: *Performance Management and Preventing Workplace Violence.*
Volume 8, Number 1 (Spring 2005): BEHG 425: *Non–Coercive Classroom Management and Preventing School Violence.*
Volume 8, Number 1 (Spring 2005): BEHG 475: *Verbal Behavior II.*
Volume 8, Number 2 (Fall 2005): BEHG 410: *Behavioriological Thanatology and Dignified Dying.*
Volume 9, Number 1 (Spring 2006): BEHG 365: *Advanced Behaviorology I.*
Volume 9, Number 2 (Fall 2006): BEHG 470: *Advanced Behaviorology II.*

**Current Syllabi by Course Number**

BEHG 101: *Introduction to Behaviorology I:*
Volume 7, Number 2 (Fall 2004).*
BEHG 102: *Introduction to Behaviorology II:*
Volume 7, Number 2 (Fall 2004).*
BEHG 201: *Non–Coercive Child Rearing Principles and Practices:*
Volume 7, Number 2 (Fall 2004).*
BEHG 355: *Verbal Behavior I:*
Volume 7, Number 2 (Fall 2004).*
BEHG 365: *Advanced Behaviorology I:*
Volume 9, Number 1 (Spring 2006).
BEHG 400: *Behaviorological Rehabilitation:*
Volume 8, Number 1 (Spring 2005).
BEHG 410: *Behaviorological Thanatology and Dignified Dying:*
Volume 8, Number 2 (Fall 2005).
BEHG 415: *Basic Autism Intervention Methods:*
Volume 8, Number 1 (Spring 2005).*
BEHG 420: *Performance Management and Preventing Workplace Violence:*
Volume 8, Number 1 (Spring 2005).*
BEHG 425: *Non–Coercive Classroom Management and Preventing School Violence:*
Volume 8, Number 1 (Spring 2005).*
BEHG 470: *Advanced Behaviorology II:*
Volume 9, Number 2 (Fall 2006).
BEHG 475: *Verbal Behavior II:*
Volume 8, Number 1 (Spring 2005).*

*An older version appeared in an earlier issue.*
A Look at Pharmacotherapy for Treatment of Severe Behavior Disturbances

Philip R. Johnson*
University of Arizona—Tucson

Abstract: Psychotropic medications are commonly prescribed to treat severe behavior problems, even though an extensive body of empirical evidence exists to support the utilization of behaviorological treatment interventions. This is of concern because behaviorological interventions are associated with considerably fewer adverse effects than pharmacological interventions. This paper begins with a brief history of the use of pharmacotherapy for treating severe behavior disturbances. A discussion regarding the benefits and problems associated with pharmacologic treatment follows; pharmacological treatment practices for several different populations are included in this discussion. Behaviorological treatments for conditions commonly treated pharmacologically are explored. The paper concludes with recommendations regarding the use of baca (behavior altering chemical agents) for treating severe behavior disturbances.

As a practicing behaviorologist, the author has frequently observed psychiatrists prescribe baca to their patients with little to no baseline data, let alone a functional assessment of the behavior(s) of concern, to inform the development of an appropriate treatment protocol. A behaviorologist practicing in this manner would correctly be deemed by his or her colleagues as having engaged in unethical behavior; yet, this is considered “business as usual” in psychiatry as well as other branches of the medical profession. Indeed, I have been told by more than one psychiatrist that finding the right baca or combination of baca is an “art.” This should come as no surprise to behaviorologists, given that psychology, with its non–natural science approach to treatment and agentially–based explanations for “mental health” disorders, has historically informed the fields of psychiatry, social work, and counseling.

Independent environmental variables manipulated by behaviorologists tend to be directly accessible and...
observable. As a result, these independent variables quite often can be adjusted fairly rapidly, when necessary, to obtain an acceptable outcome. The dependent—variable behaviors are overt—observable to behaviorologists, medical professionals, and anyone who is in the immediate setting as they occur. Behavior altering chemical agents change physiological structures that mediate (not originate) the behavior of an organism (i.e., bodily microstructures within the nervous system and the endocrine system). Unlike the dependent and independent variables that are of concern to behaviorologists, these internally located physiological dependent variables, upon which chemical interventions are directed, are not easily observed or measured. Medical professionals can rarely observe a medication’s precise effects on these microstructures. The exact nature of the internal bodily effects of a given chemical agent—“why it works and how it works”—is, in many cases, largely unknown.

An abundance of both empirical evidence and explanatory fiction are readily available to explain how and why BACAs effect behavior change in patients who take them. Antidepressants, for example, are prescribed to treat symptoms of depression, such as feelings of sadness, loss of interest, poor appetite or overeating, insomnia, low energy, and poor concentration. In the 1980s, when a class of drugs known as selective serotonin reuptake inhibitors (SSRIs) was first introduced to treat depression, the claim that depression is “caused by a chemical imbalance” was widely circulated. This assertion, regarding the etiology of depression, was introduced by the manufacturers of SSRl antidepressant drugs, in their broadcast and print advertisements. The makers of these antidepressants rather boldly claimed that their drugs could “correct” the chemical imbalance responsible for causing depression. There was then, and is now, absolutely no empirical evidence to support this claim; yet, many “behavioral health” practitioners, continue to regard it as fact and disseminate this myth to their colleagues, clients, and patients (Healy, 2004). Perhaps this seems like a feasible explanation—a phenomenon that Ledoux refers to as gratuitous physiologizing (Leduix, 2014); it certainly provides a strong hook for advertising campaigns. The “chemical imbalance” advertising campaign has resulted in huge sales of SSRl antidepressants and spawned a plethora of popular press articles and books on the benefits of these drugs, for even very minor symptoms of depression.

This paper provides a brief history of pharmacotherapy for treating severe behavior disturbances. It will then discuss the benefits and problems associated with pharmacologic treatment; BACAs will follow. Finally, recommendations regarding the use of BACAS for treating severe behavior disturbances will be provided.

The Emergence of Pharmacotherapy for Treatment of Severe Behavior Disturbances

Several drugs for treating severe behavior disturbances had been developed in the first half of the 1900s. For example, Benzodiazepines—drugs used for treating sleep disorders and anxiety—were synthesized during the 1930s and lithium was found to be useful for treating bipolar disorder in 1949 (Keltner & Folkes, 2005). However, pharmacotherapy, also known as psychopharmacology and psychopharmacotherapy, is a phenomenon that arose during the 1950s, shortly after antipsychotic medications became available by prescription. The introduction of antipsychotic medications (i.e., medications used for treating “psychotic” behavior) is considered to be a watershed event in the history of pharmacotherapy; it therefore merits some discussion.

In 1950 a French scientist, Paul Charpentier, synthesized chlorpromazine while attempting to develop a new antihistamine. Chlorpromazine was found to be highly sedating with only mild antihistaminic properties. According to Pierre Deniker (1970):

After initial trials, specialists were particularly impressed by the potent sedative activity of the drug. It was more marked than that of any known agent, was accompanied by relatively mild hypnotic activity, and caused reversible sleep. This was the real beginning of research on drugs that would soon increase in number and would be referred to as “tranquilizers.” (pp. 158–159)

Electroconvulsive therapy, and shock induced by insulin, Metrazol, or fever were considered to be the most effective means for treating severe behavior disturbances prior to the introduction of chlorpromazine. Deniker’s mention of “reversible sleep” in the above quotation is apparently a reference to researchers’ attempts to develop chemical agents that would act on “the mechanisms and structures affected by shock therapy” (Deniker, 1970, p. 156). This interest in reproducing the effects of shock therapy with chemical agents led to research on what was known at the time as “sleep therapy.” Opiates, belladonna derivatives, bromides, chloral hydrate, paraldehyde, and barbiturates were examined for the purpose of determining their efficacy for use in sleep therapy. However, according to Deniker (1970), “Sleep treatments induce only prolonged sleep” (italics added) whether they are deep narcotherapies, which were
developed in Switzerland in 1930, or ‘conditioned’ sleep therapies inspired by Pavlovian ideas. Their indications are neuroses and psychosomatic disorders rather than psychoses” (p. 156).

Henri Laborit, a French surgeon at Val-de-Grâce, was among those who were interested in chlorpromazine’s sedative properties. Laborit soon began administering the drug to his patients to alleviate anxiety during surgery (Guidry, Rinck, & Rinck, 1988; Keltner & Folks, 2001). The drug proved to be very effective in producing what Laborit referred to as an ataractic effect (literally “without emotion”) which led him to predict that it might someday be used as a psychiatric agent (Ayd, Jr., 1991; Deniker, 1970; Guidry et al., 1988).

Encouraged by Laborit’s findings, French physicians Jean Delay and Pierre Deniker began treating psychiatric patients with chlorpromazine (Deniker, 1989). In 1952, Delay and Deniker administered chlorpromazine to 38 patients who were experiencing “acute psychoses” (Ayd, Jr., 1991; Keltner & Folks, 2001). From May to July 1952, Delay and Deniker published a total of six reports on the use of chlorpromazine as an antipsychotic agent (Ayd, Jr., 1991; Deniker, 1970). Delay and Deniker reported that “agitation, aggressiveness, and delusional conditions of schizophrenia improved” (Deniker, 1970, p. 158) when chlorpromazine was administered to their patients. The drug was relatively ineffective, however, in treating the negative symptoms of schizophrenia (i.e., affective flattening, apathy, anhedonia, alogia, and avolition) (Deniker, 1970). The reports published by Delay and Deniker drew the attention of the psychiatric community, generating worldwide clinical trials of chlorpromazine (Ayd, 1963; Ayd, 1991). In 1952, chlorpromazine became available on prescription in France as Largactil (i.e., “large in action”). Many of us in the United States are more familiar with chlorpromazine’s other proprietary name: Thorazine (in reference to Thor, the Norse god of thunder and lightning).

During the mid–1950s, chlorpromazine was introduced into psychiatric practice throughout the world (Deniker, 1970). Chlorpromazine, and the numerous BACAS that followed it, are widely regarded as having transformed treatment for severe behavior disturbances. These drugs were to play a leading role in the restructuring and dismantling of the state hospital system in the United States (Keltner & Folks, 2005).

Although the original focus was on treating “psychoses,” antipsychotic medications, such as chlorpromazine, were soon introduced into institutions for persons with developmental disabilities to manage aggressive, destructive, and self-injurious behavior (Lipman, 1982). According to Lipman, antipsychotic medications were originally viewed as representing “a more humanistic and constructive alternative to the use of paraldehyde, bromide, and camisoles” (p. 262) for controlling severe behavior problems. Initially utilized for their tranquilizing rather than antipsychotic properties (antipsychotic medications were originally referred to as major tranquilizers) these agents were administered at very high doses to members of this population. High doses of antipsychotic medications alter and subsequently reduce the behavioral reactivity of relevant bodily microstructures (i.e. behavioral control is achieved by inducing sedation) (Dugan & Brylewski, 1999; Ellis, Singh, & Singh, 1997; L. E. Fraley, personal communication, 12 June 2014; Osman & Loschen, 1992).

During the 1950s and 1960s, a number of favorable case reports were published affirming the therapeutic efficacy of antipsychotic medications for decreasing severe behavior problems in individuals with developmental disabilities. By the 1970s, however, concerns about long–term adverse side effects of these medications were being given serious consideration (Lipman, 1982). For example, research on the effects of chlorpromazine on the motor behavior of two male (11 and 13 years of age) and two female (12 and 14 years of age) children with mental retardation (Hollis & St. Omer, 1972) generated concern that antipsychotic medications may interfere with operant learning. Interestingly, in a study similar to that of Hollis and St. Omer, Aman, White, and Field (1984) found that performance on an operant conditioning task was significantly impaired in four out of six profoundly retarded male study participants (age range = 12–27 years). Aman et al. hypothesized that the sedative properties of chlorpromazine might have accounted for the suppression of performance on the operant conditioning task:

We were struck by the extent of sedation in our subjects, a problem that has been encountered elsewhere with chlorpromazine in treating disturbed children, even at doses as low as nine to 15 mg per day... It is likely that chlorpromazine’s tendency to cause drowsiness accounts for some or all of the deterioration observed on the operant task. (p. 258)

Following the success of chlorpromazine and subsequent introduction of additional antipsychotic agents, pharmaceutical researchers began to test and develop drugs to treat other “psychiatric” conditions, such as depression and anxiety. Today, a myriad of drugs are available for the purpose of treating a number of “psychiatric” disorders. The existence of many of these “disorders” are questionable from a scientist–practitioner perspective. Keltner and Folkes (2005) identify the following classifications of “Drugs Used in the Treatment of Mental Disorders:”
Drugs for schizophrenia and other psychoses
Drugs for depressive disorders
Drugs for bipolar disorders
Drugs for anxiety disorders
Drugs for dementia and delirium
Drugs for seizure disorders
Drugs for insomnia and other sleep disorders
Drugs for acute psychoses in the violent patient
Drugs for the treatment of alcoholism and other substance use disorders
Drugs for sexual dysfunction

From its more or less accidental genesis in the early 1950s, pharmacotherapy has expanded into a multibillion dollar industry that is heavily financed by insurance dollars and government–subsidized “mental health” programs.

... polypharmacy [the concurrent administration of two or more medications] is the logical and desired outcome of sound business practices by the global drug industry. In fact, a real and transparent goal by the leaders of pharmaceutical corporations, beginning in the late 1950s, has been to produce medications to treat emergent, chronic conditions, like mental disorders (and cardiovascular disorders/diseases), and to ensure indefinite “maintenance therapy” through pharmaceutical management. Thus, today we have a situation where the pharmaceutical industry has worked extremely hard over many decades to normalize (for both doctors and patients) lifetime, polypharmaceutical prescriptive treatments [i.e., the practice of prescribing two or more medications that are to be administered concurrently] of mental health disorders” (Oldani, 2014, pp. 257–258).

It should be noted that, as early as the 1920s, behaviorists were conducting research and successfully treating many severe behavior disturbances prior to and during the period of time that the practice of pharmacotherapy was becoming established (American Psychiatric Association, 1974). Mary Cover Jones, for example, developed a technique to eliminate a child's fear response in 1924; during the 1950s, Joseph Wolpe developed a procedure known as systematic desensitization for treatment of anxiety. During the 1960s, researchers began using operant conditioning techniques in psychiatric hospital units to treat severe behavior disturbances manifested by persons with developmental disabilities and persons with psychiatric diagnoses (American Psychiatric Association, 1974).

Issues Concerning Pharmacotherapy for Treatment of Severe Behavior Disturbances

The adverse effects of BACAS are of major concern to those who prescribe these medications as well as to those who take them. Indeed, these adverse effects are frequently cited by patients as a reason for treatment noncompliance (Keltner & Folks, 2005). Side effects caused by BACAS include the following (Breggin & Cohen, 2000; PDR Drug Guide for Mental Health Professionals, 2004; Physician's Desk Reference, 2014):

- Anxiolytic medications (i.e., antianxiety drugs): Slowed thinking, slurred speech, lack of coordination, clumsiness, impaired walking, tremor, confusion, drowsiness, headache, nausea, dizziness, tension, anxiety, memory problems, and reduced heart rate.
- Antidepressant medications: Anxiety; agitation; mania; insomnia; suicidal ideation; depression; prolonged drowsiness or sleepiness; akathisia (a feeling of restlessness); movement disorders, such as tardive dyskinesia; seizures; weight gain; low blood pressure; mania; delirium; cardiovascular problems; confusion; blurred vision; memory problems; dizziness; nausea; and tremor.
- Antipsychotic medications: Tremor, tardive dyskinesia, impaired concentration, depression, apathy, emotional lability, mood swings, agitation, irritability, delusions, anxiety, psychosis, unusual thoughts, confusion, euphoria, memory problems, restlessness, nervousness, lethargy, aggression, hyperactivity, hostility, and “behavior problems.”
- Anticonvulsant medications (drugs that are frequently used for treating mood disorders as well as seizure disorders): Sedation, tremor, difficulty waiting, impaired concentration, and “behavioral abnormalities” (e.g., confusion and delirium).

The side effect profiles provided for the medication classifications listed above are by no means exhaustive; in fact, they are very brief. It is beyond the scope of this paper to list every single side effect for every single BACA. Interested readers are encouraged to consult the Physician's Desk Reference for more extensive side effects profiles of specific BACAS.

The practice of polypharmacy is of further concern due to the potential for adverse drug–drug interactions (Kreyenbuhl, Valenstein, McCarthy, Ganoczy, & Blow, 2007; Leuch, 2012; Zigman & Blier, 2012). Individuals with developmental disabilities, for example, are frequently prescribed several BACAS concurrently to treat coexisting behavioral problems (e.g., aggressive behavior, destructive behavior, and self–injurious behavior) and/or “psychiatric” diagnoses (e.g., bipolar disorder, schizophrenia, and depression). It is also common practice for physicians to add adjunctive...
medications when there has only been a partial response to initial medication treatment (Rush & Frances, 2000).

Qato et al. (2008) found that one in three older adults (nondisabled) living in communities in the United States were using five or more prescription medications regularly. In addition, use of prescription medications with over-the-counter medications or dietary supplements is common in this population (approximately 50% of older adults living in the community). Qato et al. concluded, after reviewing these data, that nearly one in 25 older adults living in the community are potentially at risk for a major drug-to-drug interaction. It has been my experience as a behaviorologist practitioner in Tucson, Arizona, that children who engage in problematic behaviors, or who receive a psychiatric diagnosis, are frequently prescribed one or more BACAS. The drugs most frequently prescribed to these children include antipsychotic medications, antidepressant medications, anxiolytic medications, and “mood stabilizing” medications.

The American Psychiatric Association has established and institutionalized the practice and procedure for prescribing BACAS. A formal psychiatric diagnosis, based upon criteria presented in the Association’s Diagnostic and Statistical Manual (DSM), is required by health insurance companies and state agencies that fund behavioral health and mental health services before people can receive any form of treatment from a psychiatrist, psychologist, social worker, and/or counselor. The pharmaceutical industry has intentionally developed specific medications to treat these psychiatric diagnoses. Much as a general practitioner might provide a diagnosis of strep throat and then prescribe the appropriate medication(s) for treating this medical condition, a psychiatrist might diagnose a 12-year-old male with having oppositional defiant disorder and then prescribe the appropriate medication(s) for treating this “psychiatric” condition. The biggest difference between the two practices is that diagnosis and treatment for strep throat is based upon empirical data while diagnosis and treatment for oppositional defiant disorder is not based upon any empirical data whatsoever. This is because the latter diagnosis is not a truly medical diagnosis; it assumes the existence of a putative self-agent. Yet, DSM diagnoses are not only used to provide a rationale for prescribing BACAS, they are required by many insurance companies and state behavioral health and mental health agencies before payment for behavioral and mental health services can be authorized.

Behaviorological Treatment for Conditions Commonly Treated with BACAs

As noted earlier, behaviorologists have been using operant conditioning techniques (e.g., reinforcement schedules, extinction programs, shaping, fading, chaining, etc.) for a number of decades to treat severe behavior disturbances, including anxiety, depression, obsessive–compulsive disorder, psychosis, and severe behavioral problems (Cautela, 1993; Gambril, 1977). A significant and critical difference between behaviorological and pharmacological treatment approaches is that behaviorological treatment techniques rarely produce significant adverse side effects. BACAS effect behavior change by altering specific microstructures within the behavior–mediating body. Once administered, however, BACAS do not, nor can they, seek out and solely target these specific microstructures; they are, in fact, absorbed by most, if not all, microstructures within the organism. One or more of these microstructures may be adversely affected (in essence poisoned) by the introduction of a chemical agent (Breggin & Cohen, 1999), resulting in what are commonly referred to as side effects. In contrast, behaviorological treatment techniques typically involve the manipulation of external environmental variables. Like BACAS, these techniques result in specific molecular structural changes within the nervous system (Fraley, 2008). Unlike BACAS, however, behaviorological treatment techniques are not absorbed by multiple internal microstructures because they are not ingested or administered via hypodermic injection. As a result, the risk of adverse effects from behaviorological interventions is significantly less than pharmacological interventions.

Ledoux (2014) has provided an overview of some behaviorological therapies in his review of applied behaviorology research. Of the therapies reviewed by Ledoux, Progressive Neural Emotional Therapy is the most germane to the topic of this paper. Progressive Neural Emotional Therapy (PNET) is a “passive cue-controlled progressive relaxation procedure [that] has evolved over the last four decades into a standard method of relaxation training” (Ferreira, 2012, p. 5). Ferreira (2012) also provides a thorough review of the PNET protocol. Ledoux (2014) and Johnson (2012) provide additional, although less detailed, reviews of the PNET protocol.

PNET is included in this discussion because it has been shown to be an effective intervention for treating severe behavior problems, such as aggression, destructive behavior, self-injurious behavior, hyperactivity; physiological states such as anxiety and stress; and some medical problems including tardive dyskinesia, a movement disorder caused by treatment with antipsychotic medications (see Ferreira, 1994, 2009, 2012, 2013, Ferreira & Duncan, 2002, Johnson, 2012). PNET is effective for treating the above conditions and behavioral problems because relaxation responses can greatly reduce emotional arousal. When a behaving organism is relaxed, it is in a state of homeostasis—the glandular chemicals that have been causing microstructural changes that
result in various maladaptive responses to environmental stimuli cease to be released. (Ferreira, 2013; L. E. Fraley, personal communication, 12 June 2014). This chemical and microstructural balance can result in a clinically significant reduction in the frequency, intensity, and duration of behavior(s) targeted for intervention.

Side effects from PNET are minimal to none, although people have reported experiencing minor problems during the progressive relaxation training procedure. These include muscle cramps, laughter or talking, external noise that interferes with the training session, spasms and tics, anxiety–producing thoughts, sexual arousal, and sleep (Bernstein, Borkovec, & Hazlett–Stevens, 2000). These problems are usually minor, interfere minimally with the therapeutic process, do not usually persist after the therapy session has ended, and are easily addressed by the behavioriological clinician conducting the PNET session.

Covert conditioning is an additional behavioriological procedure that has been used effectively for treating a number of severe behavior disturbances (Cautela, 1993). Covert conditioning is defined by Cautela as a theoretical model that in addition to involving a set of assumptions, refers to a set of imagery–based procedures that alter response frequency by manipulation of consequences. The term covert is employed because the client is asked to imagine both the target behavior and the consequences. The term conditioning designates that the behavioral change is a conditioning process (p. 3).

Cautela identifies seven covert conditioning procedures: covert sensitization, covert extinction, covert positive reinforcement, covert negative reinforcement, covert response cost, covert modeling, and the self–control triad. An assumption governing the use of these covert conditioning procedures is that overt (i.e., observable) and covert behaviors are similarly governed by laws of behavior, primarily operant conditioning; therefore, a target behavior, such as nausea as a consequential response to alcohol ingestion, can be conditioned either covertly or overtly with essentially the same outcome.

Like PNET, covert conditioning has been shown to be effective for treating a number of behavior problems and severe behavior disturbances (Cautela, 1993). These include anxiety, obsessive–compulsive disorder, sleep disorder, problem drinking, severe childhood phobia, severe aggression, and self–injurious behavior. Further, covert conditioning has also been effective for treating some medical problems, such as tension headache, premenstrual syndrome, and tardive dyskinesia. Cautela (1993) does not mention side effects associated with covert conditioning procedures; however, several covert conditioning procedures do introduce punishment in the treatment protocol as an imagined consequence. As Ledoux points out (2014) the use of punishment is fraught with problems. Punishment interferes with social relationships; produces aversive emotional responses, such as fear and anxiety; and evokes escape, avoidance, and/or countercoercion behaviors. It is reasonable to expect that use of punishment techniques in covert conditioning procedures may produce any one or more of these problems.

Also function–based interventions have been utilized for a number of years to address problem behavior and severe behavior disturbances in institutional settings: school settings, employment settings and day programs for individuals with disabilities, and residential settings for persons with developmental disabilities or emotional and behavioral disorders or severe behavior disturbances (American Psychiatric Association, 1974; Ferreira, 2012; Hansen, Wills, Kamps, & Greenwood, 2014; Holden & Gitlese, 2008; Matson, Cooper, Malone, & Moskow, 2008; Sulzer–Azaroff & Mayer, 1991; Wong, 1996). According to Umbreit, Ferro, Liaupsin, and Lane (2007), “The term function–based intervention refers to the development of behavior change strategies that are based on the data gathered during the [functional behavioral assessment] and that are directly linked to the function of the behavior” (p. 2).

A functional behavioral assessment (FBA) identifies (a) a clear definition of the problem behavior, (b) the antecedent conditions that existed both when the behavior occurs and when it does not occur, (c) the consequences that maintain the behavior, (d) a clear definition of the behavior we want the student [client, or patient] to exhibit in place of the problem behavior, and (e) a statement of behavioral function. (Umbreit et al., 2007, p. 2) Furthermore, “The basic goal is to use the FBA information to design an intervention that decreases problem behaviors (target behaviors) while increasing desirable behaviors (replacement behaviors)” (Umbreit et al., 2007, p. 2).

Function–based interventions have been found to be effective for treating behavior problems in persons with schizophrenia (Wilder, Masuda, O’Connor, & Baham, 2001) and individuals with a dual diagnosis (i.e., concurrent “mental health” and mental retardation diagnoses) (Lancaster et al., 2004). Function–based interventions have also produced favorable outcomes for the treatment of aggressive behavior, disruptive behavior, self–injurious behavior, and destructive behavior (Matson et al., 2008; Umbreit et al., 2007).

Function–based interventions, when implemented as designed, are associated with causing minimal to no adverse effects unless punishment procedures are utilized. If punishment procedures are utilized in function–based...
interventions, those interventions are subject to the same problems identified in the use of punishment with covert conditioning procedures.

Finally it should be noted that, in his Running Out of Time... book, Ledoux (2014, Ch. 17) has outlined a process for developing behaviorological therapies. This is a “must–read” for behaviorological practitioners.

**Recommendations**

While the use of bacas to treat severe behavior disturbances may result in a desirable behavioral outcome, the potential for significant side effects, especially when individuals are receiving two or more medications concurrently, must be given serious consideration. For this reason, it is imperative to introduce behaviorological interventions whenever it is possible to do so as first–line treatment strategies for addressing problem behaviors and severe behavior disturbances. For those cases in which behaviorological interventions do not achieve a desired result (i.e., the behavior of concern continues to result in harm to the client and/or others) then medication is a treatment option that should be considered (Matson, Bielecki, Mayville, & Matson, 2003). Additionally, if an individual is engaging in a destructive, self–injurious, and/or aggressive pattern of behavior at a high rate of frequency, strong level of intensity, and/or an extended period of duration per episode, then it may be advisable to introduce pharmacologic agents to reduce or slow down these responses to a more manageable level, while concurrently introducing a behaviorological intervention.

When pharmacotherapy is determined to be necessary, it is advisable to implement the following procedures:

1. Medication doses should be maintained at the lowest therapeutic levels;
2. Regular monitoring for changes in therapeutic effects and adverse side effects should occur;
3. Behaviorological treatment interventions should be used in conjunction with pharmacotherapy interventions;
4. Treatment with Bacas should be discontinued if/when it is therapeutically appropriate to do so;
5. Family members, other care providers, and professional service providers (i.e., behaviorological therapists, social workers, psychologists, and counselors) should receive counseling regarding how to recognize and monitor side effects caused by Bacas;
6. Agencies and institutions that provide services to persons receiving Bacas should develop and implement a system for collecting, maintaining, and monitoring data on direct effects and side effects for each individual receiving treatment with these drugs;
7. And behaviorological professionals should be available a) to provide ongoing consultation to family members and other care providers; b) to assist with the development and implementation of behaviorological and/or pharmacological treatment interventions; c) to intervene and provide guidance during crises; and d) to monitor and assess the efficacy, progress, and outcome of all treatment interventions, regardless of whether they are behaviorological or pharmacological.

Those who argue in favor of pharmacological interventions over behaviorological interventions typically point out that it is far easier to administer a pill that it is to complete a functional behavioral assessment and develop and implement a function–based intervention or treatment plan. While this assertion may be true, it is our ethical (and in some states, legal) responsibility as behaviorologists to ensure that we develop and endorse treatment techniques and strategies that are both safe and minimally restrictive. Pharmacological interventions have a demonstrably greater potential for causing harm than the behaviorological interventions and strategies herein discussed. It is, therefore, our responsibility as behaviorologists to educate clients, caregivers, other professionals, and the public at large on the merits of utilizing behaviorological interventions over pharmacotherapy for treatment of severe behavior disturbances.

**References**


Submission Guidelines

Journal of Behaviorology (previously known as Behaviorology Today) is the fully peer-reviewed Journal of TIBI (The International Behaviorology Institute) and is published in the spring and fall of each year.

To submit items, contact the Editor (Volumes 18, 19, 20):
Dr. James O’Heare
Companion Animal Sciences Institute
1333 Rainbow Crescent
Ottawa Ontario K1J 8E3
CANADA
Phone: (613) 297–0153
E-mail: jamesoheare@gmail.com

Considerations

The Journal entertains experimental or applied research papers and theoretical or conceptual or literature review articles (all of which will have at least three reviewers) as well as book reviews, on terms, in response, and program descriptions (two reviewers) plus letters, memorials, etc. The members of the TIBI Board of Directors constitute the basic Editorial Review Board (ERB) on which others can serve as members or guests. Authors will not be identified to reviewers and reviewers will not be identified to authors, except when they opt to sign their reviews. (Some reviewers prefer to sign, usually in acknowledgement of the additional assistance that they are prepared to offer the author.) Each reviewer will provide constructive feedback as well as a recommendation: accept, or accept with revisions, or revise and resubmit, or reject.

Based on the set of reviewer recommendations and comments, the Editor will convey the feedback and summary decision to the author(s). With assistance from members of the ERB, the Editor will also provide authors with guidance to shape the best manuscripts possible in a reasonable time frame.

All accepted pieces must contribute to the behaviorology discipline (e.g., by relating to or clarifying or expanding some part of the discipline such as the philosophical, conceptual, theoretical, experimental, applied, or interdisciplinary aspects). Accepted pieces must also be crafted in ways that convey as much consistency as possible with the principles, concepts, practices, philosophy, and terminology of the discipline.

Research paper authors (a) must obtain any necessary permissions or approvals from the Human–Subjects Review Committee of their affiliated campus or agency, and (b) must comply with the usual ethical standards relating to all research and experimental subjects. All authors are required to disclose for publication any possible conflicts of interest. Also, congruent with past practice, exclusions of important or relevant content for length reduction will be resisted as much as possible.

Mechanics

Authors are encouraged to contact the editor to discuss their manuscript prior to submission to answer questions and clarify procedures and processes. Initially, a paper should be submitted to the editor by email as a PDF attachment.

The email will contain a cover letter. This letter should describe the article, and the work or history behind it, and will include the author name(s), affiliation(s), addresses, phone numbers, paper title, footnotes (e.g., acknowledgements, disclosures, and email or other contact information for publication) as well as comprehensive contact information on up to six suggestions for possible reviewers.

The PDF document (a) should have only the author's name in the file name (which the Editor will record with the assigned manuscript number while replacing the name with the number in the file name before sending the manuscript PDF file out to reviewers), (b) should use the standard style exemplified by papers in past issues of the journal (as TIBI is unconnected with any particular, formal “style”), and (c) should be set in 12 point type on 24 point leading (i.e., double spaced) with 1.25 inch side margins and 0.75 inch top and bottom margins, excluding the title header and page–number footer (i.e., all text parts of the piece—including tables, figures, photos, etc.—fit in text blocks that are 6.0 inches wide and 9.5 inches tall, with the title header just above this block and the page–number footer just below this block). These measurements are for US letter size paper; for other paper sizes, the text block size and top margin remain the same while the other margins will change as needed. The text parts of the paper start with the title, then an abstract, and a list of “Key Words” for indexing purposes, followed by the body of the piece plus references and figures or tables. Upon acceptance, papers should be provided to the editor as a Word-format document along with a new PDF of the Word file (to verify the accuracy of content transfers during page–layout operations).

Note: Authors’ views need not coincide with official positions of TIBI, and authors retain copyrights. 😊
Stay informed by visiting the TIBI web site regularly (www.behaviorology.org). We are always adding and updating material.

You can find a wide selection of useful articles, many from Behaviorology Today / Journal of Behaviorology, in Adobe PDF format. (If you need it, you will find a button to click, for a free download of Adobe’s Acrobat Reader software, in the “First 10–years Archive” part of the site.) Also in the “First 10–years Archive,” the articles are organized on several topical category pages (e.g., contributions to parenting and education, book reviews, and behaviorology around the world). The rest of the site features a single PDF for each full issue of both Behaviorology Today and Journal of Behaviorology. Other selections feature descriptions of TIBI’s certificate programs and course syllabi, and links to some other helpful related web sites. Explore!


**TIBIA Membership Costs & Criteria & Benefits**

The intrinsic value of TIBIA membership rests on giving the member status as a contributing part of an organization helping to extend and disseminate the findings and applications of the natural science of behavior, behaviorology, for the benefit of humanity. The levels of TIBIA membership include one “free” level and four paid levels, which have increasing amounts of basic benefits. The four annual paid membership levels are Student, Affiliate, Associate, and Advocate. The Student and Affiliate are non-voting categories, and the Associate and Advocate are voting categories. All new members are admitted provisionally to TIBIA at the appropriate membership level. Advocate members consider each provisional member and then vote on whether to elect each provisional member to the full status of her or his membership level or to accept the provisional member at a different membership level. Here are all the membership levels and their criteria and basic benefits (with dues details under TIBIA Membership Cost Details on the application–form page):

**Free–online membership.** Online visitors receive access (a) to past Behaviorology Today and Journal of Behaviorology articles and issues, (b) to accumulating news items, (c) to Institute information regarding TIBI Certificates and course syllabi, (d) to selected links of other organizations, and (e) to other science and organization features.

**$20 Behaviorology Student membership** (requires completed paper application, co–signed by department chair or advisor, and annual dues payment). Admission to TIBIA in the Student membership category is open to all undergraduate or graduate students in behaviorology or in an acceptably appropriate area. Benefits include all those from the previous membership level plus these: (a) a subscription to—and thus immediate postal delivery of—each new paper–printed issue of Journal of Behaviorology (issn 1536–6669), (b) access to special organizational activities (e.g., invitations to attend and participate in, and present at, TIBI conferences, conventions, workshops, etc.) and (c) access to available TIBIA member contact information.

**$40 Affiliate membership** (requires completed paper application and annual dues payment). Admission to TIBIA in the Affiliate membership category is open to all who wish to follow disciplinary developments, maintain contact with the organization, receive its publications, and participate in its activities, but who are neither students nor professional behaviorologists. Benefits include all those from the previous levels plus these: Access both to additional activity options at the interface of their interests and behaviorology, and to advanced membership levels for those acquiring the additional qualifications that come from pursuing behaviorology academic training. On the basis of having earned an appropriate degree or TIBI Certificate, Affiliate members may apply for, or be invited to, Associate membership.

**$60 Associate membership** (requires completed paper application and annual dues payment). This level is only available to qualifying individuals. Admission to TIBIA in the Associate membership category is open to all who are not students, who document a behaviorological repertoire at or above the masters level (such as by attaining a masters–level TIBI Certificate or a masters degree in behaviorology or in an accepted area) and who maintain a good record—often typical of “early–career” professionals—of professional activities or accomplishments of a behaviorological nature that support the integrity of the organized, independent discipline of behaviorology including its organizational manifestations such as TIBI and TIBIA. Benefits include all those from the previous levels plus TIBIA voting rights, and access to contributing by accepting appointment to a TIBIA or TIBI position of interest. On the basis of documenting a behaviorological repertoire at the doctoral level, an Associate member may apply for, or be invited to, Advocate membership.

**$80 Advocate membership** (requires completed paper application and annual dues payment). This level is only available to qualifying individuals. Admission to TIBIA in the Advocate membership category is open to all who are not students, who document a behaviorological repertoire at the doctoral level (such as by attaining a doctoral–level TIBI Certificate or a doctoral degree in behaviorology or in an accepted area), who maintain a good record of professional activities or accomplishments of a behaviorological nature, and who demonstrate a significant history—usually typical for experienced professionals—of work supporting the integrity of the organized, independent discipline of behaviorology including its organizational manifestations such as TIBI and TIBIA. Benefits include all those from the previous levels plus access to contributing by accepting election to a TIBIA or TIBI position of interest.
**TIBIA Membership Cost Details**

Establishing the annual dues structure for the different membership categories takes partially into account, by means of percentages of annual income, the differences in income levels and currency values among the world’s various countries and economies. Thus, the annual dues for each membership (or other) category are:

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>DUES (in US dollars)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student member</td>
<td>The lesser of 0.1% of annual income, or $20.00</td>
</tr>
<tr>
<td>Affiliate member</td>
<td>The lesser of 0.2% of annual income, or $40.00</td>
</tr>
<tr>
<td>Associate member</td>
<td>The lesser of 0.3% of annual income, or $60.00</td>
</tr>
<tr>
<td>Advocate member</td>
<td>The lesser of 0.4% of annual income, or $80.00</td>
</tr>
<tr>
<td>Member of Board of Directors</td>
<td>The lesser of 0.6% of annual income, or $300.00</td>
</tr>
<tr>
<td>(Retired Board Members: … $150.00)</td>
<td></td>
</tr>
</tbody>
</table>

*Minimums: $20 Board Member; $10 others

---

**TIBIA Membership Application Form**

(For contributions, a form ensures acknowledgement but is not required.)

Copy and complete this form (please type or print)—for membership, contributions, back issues, or subscriptions—and send it with your check (made payable to TIBIA in US dollars) to the TIBIA treasurer at this address:

Dr. Stephen Ledoux  
TIBIA Treasurer  
suny–CTC  
34 Cornell Drive  
Canton NY 13617 USA

Check if applies:  
Contribution:  
Subscriptions:*  
Back issues:**  
*Vol. ___, #___  
*Vol. ___, #___

Name:  
Office Address:  
Amount enclosed: US$  
Home Address:  
Home Phone #:  
Office Phone #:  
CHECK PREFERRED MAILING ADDRESS:  
Office:  
Home:  
Sign & Date:  

*Subscriptions are US$40 annually, the same as affiliate membership. **Back issues: US$20 each.

***For Student Membership:  
I verify that the above person is enrolled as a student at:  
Name & Signature of advisor or Dept. Chair:
**TIBI / TIBIA Purposes**

**TIBI**, as a non-profit educational corporation, is dedicated to many concerns. **TIBI** is dedicated to expanding and disseminating the behaviorological literature at least through the fully peer-reviewed *Journal of Behaviorology* (previously called *Behaviorology Today*) and the behaviorology.org web site; **TIBI** is also dedicated to teaching behaviorology, especially to those who do not have university behaviorology departments or programs available to them; **TIBI** is also a professional organization dedicated to organizing behaviorological scientists and practitioners into an association (*The International Behaviorology Institute Association*—**TIBIA**) so that they can engage in a range of coordinated activities that carry out their shared purposes. These activities include (a) holding conventions and conferences and so on; (b) enabling **TIBI** faculty to arrange or provide training for behaviorology students; and (c) providing **TIBI** certificates to students who successfully complete specified behaviorology curriculum requirements. And **TIBI** is a professional organization also dedicated to representing and developing the philosophical, conceptual, analytical, experimental, and technological components of the separate, independent discipline of behaviorology, the comprehensive natural-science discipline of the functional relations between behavior and independent variables including determinants from the environment, both socio-cultural and physical, as well as determinants from the biological history of the species. Therefore, recognizing that behaviorology’s principles and contributions are generally relevant to all cultures and species, the purposes of **TIBI** are:

A. to foster the development of the philosophy of science known as radical behaviorism;

B. to nurture experimental and applied research analyzing the effects of physical, biological, behavioral, and cultural variables on the behavior of organisms, with selection by consequences being an important causal mode relating these variables at the different levels of organization in the life sciences;

C. to extend technological application of behaviorological research results to areas of human concern;

D. to interpret, consistent with scientific foundations, complex behavioral relations;

E. to support methodologies relevant to the scientific analysis, interpretation, and change of both behavior and its relations with other events;

F. to sustain scientific study in diverse specialized areas of behaviorological phenomena;

G. to integrate the concepts, data, and technologies of the discipline’s various sub-fields;

H. to develop a verbal community of behaviorologists;

I. to assist programs and departments of behaviorology to teach the philosophical foundations, scientific analyses and methodologies, and technological extensions of the discipline;

J. to promote a scientific “Behavior Literacy” graduation requirement of appropriate content and depth at all levels of educational institutions from kindergarten through university;

K. to encourage the full use of behaviorology as an essential scientific foundation for behavior related work within all fields of human affairs;

L. to cooperate on mutually important concerns with other humanistic and scientific disciplines and technological fields where their members pursue interests overlapping those of behaviorologists; and

M. to communicate to the general public the importance of the behaviorological perspective for the development, well-being, and survival of humankind.

---

*This statement of the **TIBI**/**TIBIA** purposes has been adapted from the **TIBI** by-laws.—Ed.*
About Behaviorology, TIBI, and Journal of Behaviorology

Behaviorology is an independently organized discipline featuring the natural science of behavior. Behaviorologists study the functional relations between behavior and its independent variables in the behavior–determining environment. Behaviorological accounts are based on the behavioral capacity of the species, the personal history of the behaving organism, and the current physical and social environment in which behavior occurs. Behaviorologists discover the natural laws governing behavior. They then develop beneficial behaviorological–engineering technologies applicable to behavior–related concerns in all fields including child rearing, education, employment, entertainment, government, law, marketing, medicine, and self–management.

Behaviorology features strictly natural accounts for behavioral events. In this way behaviorology differs from disciplines that entertain fundamentally superstitious assumptions about humans and their behavior. Behaviorology excludes the mystical notion of a rather spontaneous origination of behavior by the willful action of ethereal, body–dwelling agents connoted by such terms as mind, psyche, self, muse, or even pronouns like I, me, and you.

As part of the organizational structure of the independent natural science of behavior, The International Behaviorology Institute (TIBI), a non–profit organization, exists (a) to arrange professional activities for behaviorologists and supportive others, and (b) to focus behaviorological philosophy and science on a broad range of cultural concerns. And Journal of Behaviorology is the referred journal of the Institute. Journal authors write on the full range of disciplinary topics including history, philosophy, concepts, principles, and experimental and applied research. Join us and support bringing the benefits of behaviorology to humanity. (Contributions to TIBI or TIBIA—the professional organization arm of TIBI—are tax deductible.)
Some tibi Board Member Contacts:

John B. Ferreira, Ph.D., LPC (Chair)
Ess–Plus Behaviorological Counseling
Tucson AZ
jbf721@aol.com

Lawrence E. Fraley, Ed.D.
Professor (Retired)
West Virginia University at Morgantown
lfraley@citlink.net

Philip R. Johnson, Ph.D., CRC (Editor)
Professor, University of Arizona
Tucson AZ
johnsonp@email.arizona.edu

Stephen F. Ledoux, Ph.D. (Treasurer)
Professor, State University of New York at Canton
Canton NY
ledoux@canton.edu

James O’Heare, DLBC
Companion Animal Sciences Institute
jamesoheare@gmail.com
(613) 297–0153

Donn Sottolano, Ph.D., BCBA–D
ACES Autism Center
Norford CT
d_sottolano@comcast.net

Deborah Thomas, Ed.D.
Professor, Washington State Community College,
Marietta OH
dthomas@wsc.edu

Journal of Behaviorology

Dr. Philip R. Johnson, Editor
College of Education
University of Arizona
1430 E Second Street
Tucson AZ 85721–0069 USA