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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.

* 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.)

Volume 16, Number 2 **Fall 2013**

Editorial

Philip R. Johnson

University of Arizona Tucson

This issue of the *Journal of Behaviorology* features two articles, some announcements, and the usual information resources. In the first article, Stephen Ledoux focuses on equipment used in experimental research pertaining to multiple simultaneous operant responses and the resulting multiple consequences that they produce. Most of this research was conducted over 40 years ago using what is now considered antiquated equipment. After a review of some of this research to examine the interaction of research aims and procedures with equipment concerns, Dr. Ledoux describes both the older equipment and the improved equipment that is available today. Appropriate procedures using this current technology will enable researchers to systematically extend the study of multiple, simultaneous responses and consequences to include the full range of basic contingencies (e.g., conditioning, extinction, evocation, shaping, chaining, fading, schedules, and punishment) that previously were studied with procedures and equipment that disallowed response or consequence *simultaneity* by requiring response *succession,* usually with a single response manipulandum and a single consequence source.

In the second article, John Ferreira addresses another aspect of Progressive Neural Emotional Therapy (PNET). His previous article (Ferreira, 2012) expanded the PNET literature with a description of the process and procedure of PNET as a valuable, standardized tool for behaviorological practitioners to use when addressing problems related to functional behaviors and physical health. In the current article, Dr. Ferreira proposes a potentially controversial paradigm that involves parallel operant processes—an interface between the *ectosystem* (including the external environment) and the *endosystem* (including the internal environment) each of which can be subjected to behaviorological analysis. Of particular interest is the manner in which Dr. Ferreira assigns operant parameters to analyze and explain conditioning of internal behaviors (referred to as *endobehaviors*) that have heretofore been analyzed and explained using a respondent paradigm. As with any article, if Dr. Ferreira's proposal proves provocative, particularly about the conditioning of emotional behaviors, this journal welcomes the submission of letters to the editor or articles addressing any controversy as part of our commitment to the ongoing self–correction of science (see the Submission Guidelines on page 10).

I would also like to remind everyone that the *TIBI 27th Behaviorology Anniversary Convention* has been scheduled for 21–23 May 2014 in Canton, NY. The convention will focus on contributions behaviorologists can make in addressing the many aspects of behaviorology's scientific and cultural missions for improving society and individuals' lives. The convention will be held in the Laurentian Room of the *Best Western University Inn* at 90 East Main Street, Canton.

On a final note, I am very pleased to announce the impending release of another behaviorology book, *Running Out of Time—Introducing Behaviorology to Help Solve Global Problems* (Ledoux, 2014). With Chapter 1 based on "Behaviorism at 100 unabridged" (Ledoux, 2012) the cover of this 600–page, 24–chapter book points out that "Behaviorology is the natural science of WHY human behavior happens, a natural science to help build a sustainable society in a timely manner." The publisher (BehaveTech Publishing of Ottawa, Canada) expects the book to be available by early February 2014. It contains an extensive glossary, bibliography, and index. (Copies can be purchased through local bookstores or ordered from the main distributor, **Direct Book Service, Inc.**, at 800–776–2665. They will likely answer the phone with "Dogwise," because their most popular speciality involves books about our canine friends; several of these books already specifically apply the laws of behavior that *Running Out of Time…* systematically introduces.) TIBI will have this book available for $60—the list price is $63—at the May 2014 Canton convention along with CDs for $10—the list price is $12—of the public–radio interview with the organizers (Lawrence Fraley, Stephen Ledoux, Ernie Vargas, and Julie Vargas) of the first behaviorology convention that was held ten miles from Canton, in Potsdam NY, in 1988.❧

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Human Multiple Operant Research Equipment

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Abstract

People commonly observe the simultaneous occurrence of operant responses, and the simultaneous consequences that these responses often produce, in the behavior of animals, including humans. Since reinforcing consequences affect any operant whose occurrence precedes them, the occurrence of any reinforcer following any particular operant may coincidently affect any other operant that occurs simultaneously, or even nearly so, with the particular operant, thereby conditioning superstitious behaviors. Various laboratory procedures have generally avoided such concurrent superstitions by eliminating the simultaneity of either the responses or the consequences or both. Such procedures preclude studying simultaneous responses and simultaneous consequences. Previous research with simultaneously evocable and simultaneously reinforceable multiple operants of typical human subjects demonstrated a type of *multiple selector–source procedure* that produces contingency control without concurrent superstition, thereby enabling study of these phenomena. This research, however, used antiquated equipment that is no longer available. Review of this research, and comparison of its equipment with currently available apparatus, is in order, as this may enable other researchers to raise in detail the kinds of questions that thorough experimentation in this area might answer after replicating the earlier work and extending it to cover a range of basic contingency components including at least response conditioning, stimulus evocation, generalization, reinforcement schedules, and punishment control.

Over the last 75 years, as researchers gradually extended contingency studies with rat and pigeon subjects to studies with human subjects, many—perhaps most—of the human operants studied, like most operants studied with other animals, involved responses on a single manipulandum with a single unconditioned–reinforcer source such as a single food hopper or a single water spout, or a single conditioned–reinforcer source such as a single point counter (with points exchangeable for money, which is exchangeable for… anything).

Those arrangements also helped control for the problem that most researchers call *concurrent superstition.* Since reinforcing consequences affect any operant whose occurrence precedes them, then an operant that occurs simultaneously, or even nearly so, with one or more other operants may be affected by the occurrence of any reinforcer following any of these operants. This concurrent–superstition problem can occur whenever research involves responses on multiple manipulanda.

Virtually everyone commonly observes the simultaneous occurrence of multiple operant responses, and the multiple and often simultaneous consequences that these responses produce, in the behavior of animals, including—perhaps especially—humans. In life beyond the laboratory, however, these observations show that each of the consequences has its own source. Consider an example of multiple, simultaneous responses, and their multiple, simultaneous consequences from separate sources. A human at a convention might be under contingencies compelling both writing a note with her right hand about something a speaker is saying and at the same time scratching the itch of a mosquito bite on her ankle with her left hand (with the contingencies operating directly through energy exchanges with the behavior–mediating physiology; see Ledoux, 2014). Both responses are occurring simultaneously, and both are producing consequences that are occurring simultaneously (the appearance of a helpful memorandum and the reduction of a bothersome itch).

Consider several, more complex examples. (a) A late–afternoon convention speaker's lame joke evokes smiling during the interval in which the room's wall clock, showing your normal dinner time, is evoking the neural behavior (Fraley, 2008) of thinking about where and with

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Key words: concurrent superstition, digital research equipment, multiple selector–source procedure, operant behavior, simultaneous human behaviors, simultaneous reinforcers.

whom to have dinner after the paper session ends. (b) In playing the pipe organ, sometimes each hand may need to deal simultaneously with different rhythms, as well as different notes, while at the same time each foot may also need to deal simultaneously with different rhythms, as well as different notes. (c) During travel by car, the neural behavior of day–dreaming about spending the winnings from some lottery occurs at the same time as the neuro–muscular behavior of successfully negotiating a variety of curves on the highway. All of these examples involve the evocation of simultaneous responses that produce simultaneous, separately sourced consequences.

Yet, simple or complex, in all those cases researchers must wonder if any one of the reinforcers, produced by the multiple–responses, is affecting the rate of any of the other, simultaneously occurring operants that did not produce it. Whether or not that occurs is an experimental question, one that the usual sets of laboratory equipment and practices avoid in various ways, an avoidance that seems originally to have arisen simply as an artifact of the design of early experimental equipment. Such equipment originally included only one manipulandum and only one reinforcer source. Unsurprisingly the success of answering numerous research questions with such equipment led to its continued, and little questioned, use.

Response Succession Practices

The common ways to avoid the problem of concurrent superstitions involve implementing procedures that enforce what researchers can call *response succession,* in which responses can only follow one another. The price of response succession, however, is the elimination of the potential simultaneity of the responses along with the potential simultaneity of any consequences that the responses produce. Here are four of the most common response–succession procedures:

- Response Succession through *Biological Reality:* Responses cannot occur at the same time due to physiological facts, such as pigeons facing multiple manipulanda (e.g., keys) but having only one head with which to peck (e.g., Catania, 1966).
- Response Succession through *Apparatus Structures:* Responses cannot occur at the same time because the distance separating the multiple manipulanda exceeds the reach of subjects who can then operate only one manipulandum at a time (e.g., Hearst, 1961).
- Response Succession through *Contingency Constraints:* Responses cannot occur at the same time due to an additional contingency such as a change–over delay (COD) in which every first response on a different manipulandum starts a timer that delays the occurrence of reinforcement (e.g., Catania & Cutts, 1963).
- Response Succession through *Instructional Effects:* Responses cannot occur at the same time because instructions, about operating only one manipulandum at a time, control responses on multiple manipulanda (e.g., Striefel, 1972).

Actually, those response–succession procedures do not control concurrent superstitions all that well. Many researchers experienced findings similar to those of Catania and Cutts (1963) who observed much variability in superstition across their human subjects with or without CODs (which for some time were the most common method for avoiding concurrent superstitions). While the scientifically appropriate simplification of the full range of early research and equipment considerations—including essentially single sources for consequences—evoked the development of response–succession procedures, at some point the need to study increasingly complex—including normal, especially human—behaviors requires expanding the use of methods that can manage the simultaneity of responses and consequences without incurring concurrent superstitions.

Such methods can enable studying simultaneity, of responses and of consequences, for its own sake and in relation to any basic or complex contingency arrangement, or even as a measurement procedure itself. For example the rate or another response parameter, from one manipulandum, can provide a measure of any emotional effects from changes in the schedule or other independent variable on another manipulandum (see Ferster 1957). The currently available method for research on simultaneous responses and consequences—without concurrent superstition—is one that researchers generally call the *multiple selector–source procedure.*

Multiple Selector–Source Procedure: Review of Data and Equipment

The research that developed the multiple selector–source procedure found it quite effective in solving the problem of concurrent superstitions (for more details than this paper covers, see Ledoux, 2010). In this research human subjects pressed continuously available telegraph keys, one for each hand, that could be pressed simultaneously. Some presses from either key produced point reinforcers on a single, center–of–console counter, while other presses produced point reinforcers on one of two side–of–console counters that only incremented points from presses on the key that was below it. The equipment simultaneously delivered any simultaneously produced reinforcers. This research used the equipment shown in Figure 1 and the recorders shown in Figure 2, while Figure 3 shows some of the data from this research.

At various times, for a half–dozen normal human subjects, the pressing responses of each hand were under contingencies of either continuous reinforcement (CRF) or extinction (EXT). Six sets of such contingency pairs occurred in each of three sessions (with each session lasting about one half hour). One session was a within–session comparison, the "W" session, and the other two sessions comprised a between–sessions comparison, the "B1" and "B2" sessions. In the W session (see Figure 3) the first three contingency pairs involved point reinforcers, from key presses, accumulating on the single, center counter; then the same contingency pairs repeated while the reinforcers from key presses accumulated on one or the other of the dual counters, one on each side of the console, that registered reinforcers from presses of the key on that side. In the B1 and B2 sessions, one session involved a sequence of six contingency pairs with all reinforcers, from presses on either key, accumulating only on the center counter, while the other session involved the same six contingency pairs, but with each reinforcer accumulating on the side counter connected with the key the pressing of which had produced the reinforcer.

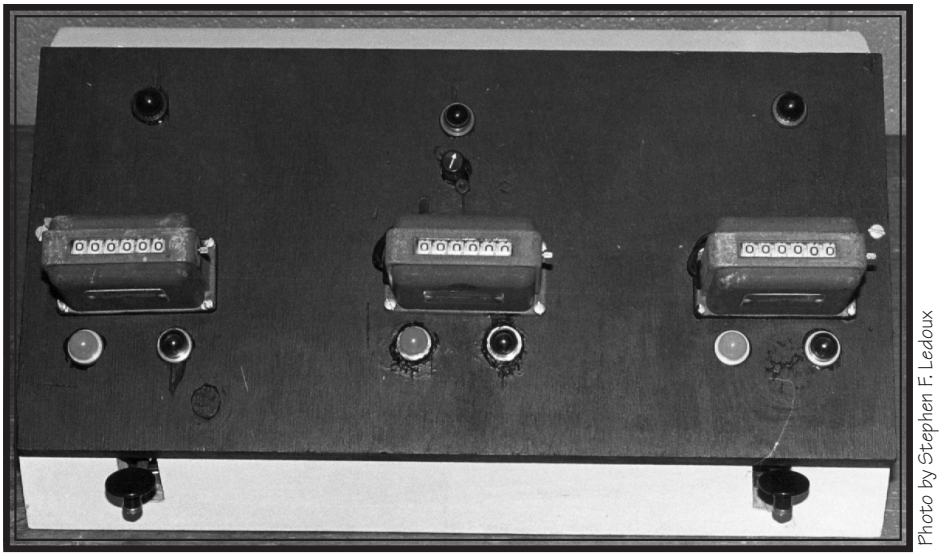

Photo by Stephen F. Ledoux

Figure 1. Arrangement of response manipulanda and stimuli.

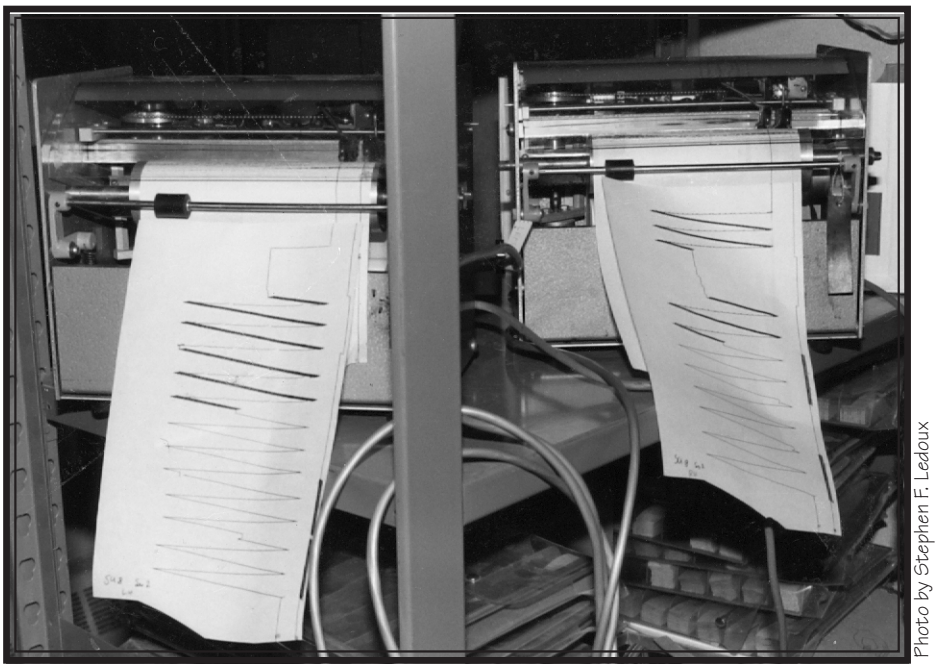

Photo by Stephen F. Ledoux

Figure 2. Arrangement of the two cumulative recorders.

Data Review

Consider a sample of the results (from Ledoux, 2010). Figure 3 shows cumulative records for the left and right hand responding of Subjects BS and GS in the W session. Note that when the single, center–counter reinforcer source provided reinforcer points, each CRF–reinforcement appears as a hatch mark on the cumulative recorder's *event* pen line, making a notably thicker line in sections of the horizontal line at the bottom of each cumulative record, rather than on the response slope lines. This single–source hatch–mark placement improves data control over experimenter/viewer analysis responses, because it clearly indicates graphically that the center, single source delivered these reinforcers. While this hatch–mark placement holds for the first three CRF/EXT pairs, for the second three CRF/EXT pairs each CRF–reinforcement appears in the usual cumulative–graph location as a hatch mark on the *slope* line at the response increment that indicates the exact pressing response of the particular hand that produced the reinforcer, and these reinforcers accumulated on the counter on the same side as the pressed key. These dual–source CRF–reinforcement hatch marks also make a notably thicker line on the slope line.

The W–session data in Figure 3 typify the data not only in the B1 and B2 sessions for these subjects, but also typify the data throughout the original study. The original–study data show that a contingency change

from CRF to extinction *usually produced superstitious responding* (i.e., that responding was usually insensitive to a contingency change from CRF to extinction) *when reinforcer points accrued on the single, center–console, reinforcer–source counter.* (In the original study, *superstitious* responding occurred after 75% of the contingency changes from CRF to extinction under the traditional single–reinforcer source.) On the other hand (no pun intended) in the original study, a contingency change from CRF to extinction *always produced extinction* (i.e., responding was always sensitive to a contingency change from CRF to extinction) *when reinforcer points accrued on the dual, separate reinforcer–source counters* on the sides of the console above the keys. (In the original study, superstitious responding *never* occurred after a contingency change from CRF to extinction under the dual, separate reinforcer–source procedure.)

Twentieth Century Research Equipment

Since those data support the dual reinforcer–source procedure as a viable multiple selector–source procedure, the culture might benefit from experimenters using it in further research. They could extend the use of this procedure to study more thoroughly the simultaneous responses and simultaneous selectors of multiple operants with typical human subjects. They could begin by reexamining, with simultaneous responses and selectors, the range of basic contingency components previously only studied with a single manipulandum and a single selector source, including response conditioning, establishing and abolishing operations, stimulus evocation, generalization, reinforcement schedules, and punishment control. Any discoveries that might ensue must await the occurrence of this research.

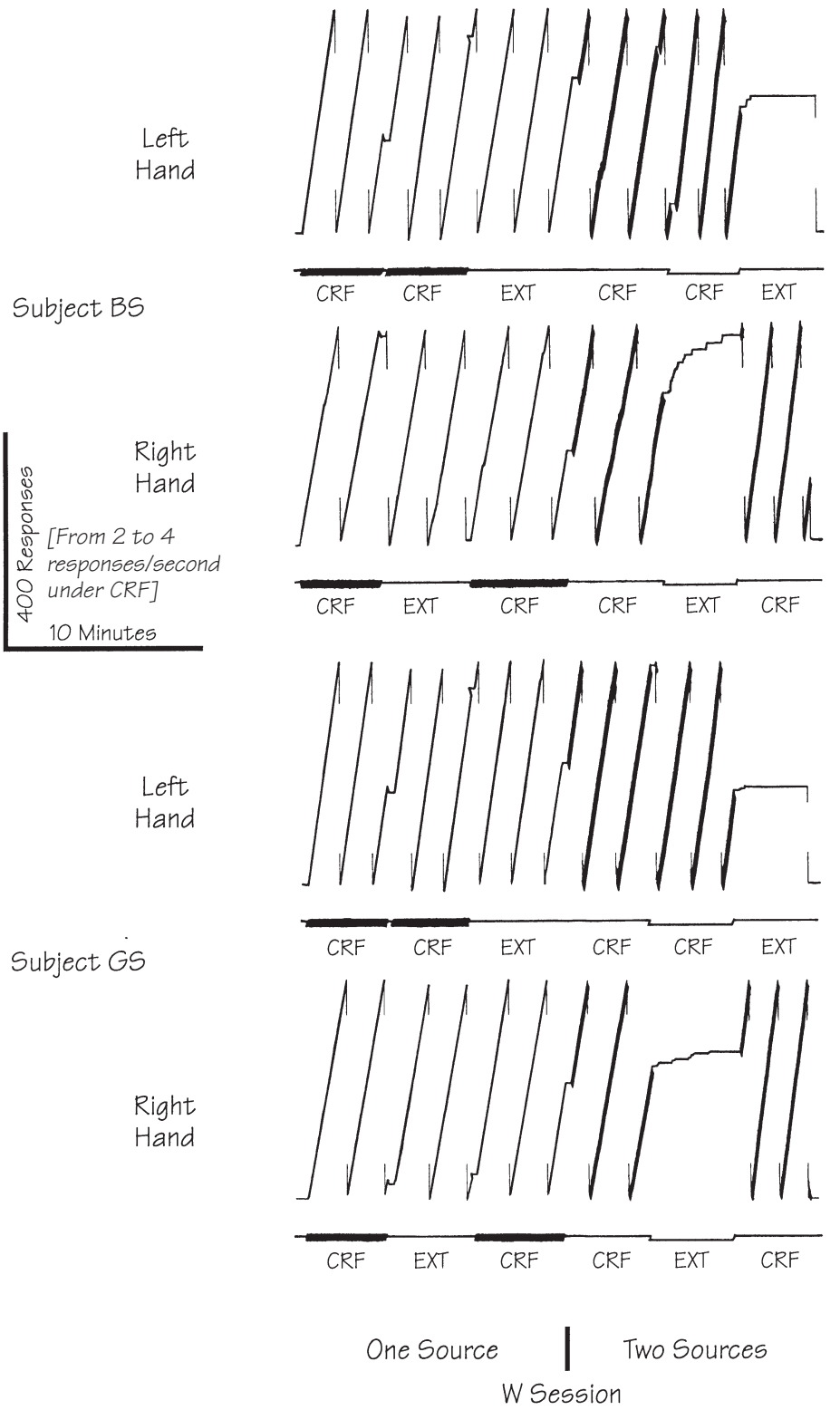

Figure 3. Cumulative records of left and right hand responding for subjects BS and GS during the W session.

The study that first showed viability for a multiple selector–source procedure, however, used equipment that is now rather antiquated. Again, consider Figure 1 and Figure 2. Figure 1 shows the locally constructed console containing the two response manipulanda (i.e., the telegraph keys) and the stimuli (i.e., the assorted lights along with the point–

incrementing reinforcer–source counters of then "off–the–shelf" electromechanical design). Note that the electromechanical counters could barely keep up with the computer–interface impulses to add points (and could *not* decrement points). Figure 2 shows the two commercially produced but no longer available cumulative recorders.

Twenty–First Century Research Equipment

For further research using the multiple selector–source procedure, experimenters need to adopt new equipment. Apparatus available in the twenty–first century should be able to replicate and extend studies with this procedure. While other equipment and arrangements are possible, the equipment and its physical arrangement, upon which this paper focuses, involves standardized components that *Med Associates* produces. (Med Associates is a company in St. Albans, Vermont; a list of the parts and part numbers, for the equipment arrangements that this paper describes, appear in Table 1 before the References. The author has *no* connection with Med Associates other than as a potential customer.)

Twenty–first century equipment includes three principle components. The first component consists of a computer (a) to drive antecedent and postcedent stimulus occurrences in accordance with the timing, sequencing, and other contingency requirements of the experiment, (b) to record the count, time stamp, and any other necessary and specified parameter (e.g., force or duration) of response events, and (c) to calculate and display parameter–adjustable cumulative records (along with numerous other data–display possibilities). The second component consists of a console to provide antecedent and postcedent stimuli, and to hold manipulanda. And the third component consists of an interface to connect the computer to all the functional parts of the stimuli/manipulanda console.

The Stimuli and Manipulanda Console

One arrangement for a basic console includes two stacked modular cabinets. Each cabinet measures 14 inches tall and 19 inches wide for a total console size of 28 inches tall by 19 inches wide (see Figure 4). For comparison, the wooden console in Figure 1 was nine inches tall by 19 inches wide.

The new console could seem rather imposing, as well as complicated, with all its component stimuli and manipulanda (even though only some components may function at any particular point in time). Should this deter adoption and use of such consoles? Probably not, since the world in which normal human behavior occurs—the kind of behavior at the focus of this research—could also seem rather imposing and complicated, with all its component stimuli and manipulanda (and also with only some components functioning in contingencies of concern at any particular point in time).

As Figure 4 shows, each of the two stacked cabinets contains five vertical panels. In the top cabinet, the center panel contains, from the top, a house light, a Lindsley Plunger (perhaps for a start response, or an emergency/panic stop response), an unused–space cover, a speaker with sound the level of which is subject to fading, and a white stimulus light the brightness of which is subject to fading. The two panels on each side of the center panel contain only unused–space with whole–panel covers, while each outside panel only holds, beneath an unused–space cover, a speaker and light like the ones in the center panel and similarly placed.

The lower cabinet contains the majority of stimuli and manipulanda. Each of the two panels on the sides of the center panel contain, beneath an unused–space cover, only a Lindsley Plunger at the bottom. The center panel and both outside panels each contain, from the top, (a) a green light as a simple visual evocative stimulus, (b) an ordinary speaker as a simple auditory evocative stimulus, (c) an unused–space cover (separating the evocative stimuli from the conditioned reinforcing stimuli and manipulanda), (d) a digital point counter (which can keep up with computer impulses both to increment and decrement points), (e) three side–by–side lights (green, yellow, and red) that can serve various functions (e.g., a green flash accompanying a point increment, a red flash accompanying a point decrement, and a yellow light which can flash as a pacer in training routines), and (f) a lever (some models of which are force adjustable).

Working with that equipmen, researchers can address a wide range of questions about the multiple antecedent and postcedent controls on the multiple, simultaneous behaviors of typical human subjects. And the consequences can be reinforcers or punishers (e.g., punishers as decrements of previously incremented points, a type of punishment about which human–subject review–committee members are generally, and appropriately, more understanding).

The Cumulative Record Producing Computer

In place of electromechanical cumulative recorders, with their paper rolls upon which their ink pens mark fixed–characteristic cumulative records, researchers can now use computers to produce cumulative records that feature adjustable characteristics. The computer screen shows data records that the computer calculates and sends *without pens* to the screen. The line that the traditional recorder's event pen would have traced becomes merely the *event line* along the bottom of the computer screen, and the line from the traditional rate/slope pen becomes merely the *rate/slope line.* Also the computer can supply additional lines and markers that can track

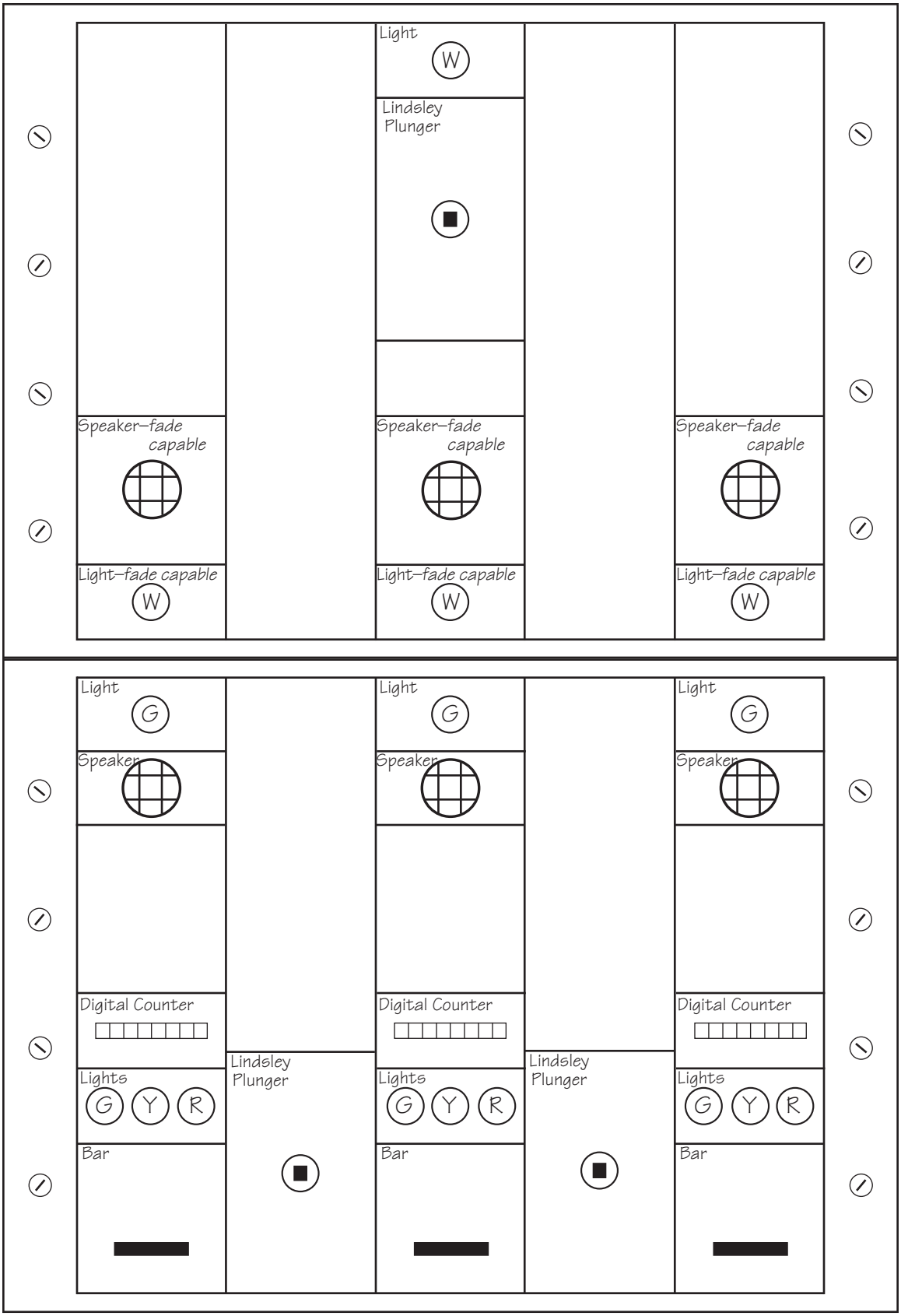

Figure 4. *Console of two modular cabinets, one stacked atop the other, and each 19–inches wide by 14–inches tall (drawn to approximate scale).*

other experimental concerns (e.g., the computer could mark "UC" at the hatch mark for the occurrence of an unconditioned reinforcer; see Ledoux, 2014, Chapter 8, for additional possibilities).

The computer sends the data to the computer screen according to the particular parameters that the experimenter sets for the program (e.g., "Display _200_ responses vertically and _2_ cm/minute horizontally"). The researcher can set such parameters before the experiment. Furthermore the experimenter can adjust these parameters after the experiment, during data analysis, which can enhance the control that the data exert over the researcher's analysis behavior. The computer simply recalculates and displays the data according to the newly set parameters. For example, one might change from "Display _200_ responses vertically and _2_ cm/minute horizontally" to "Display _400_ responses vertically and _1_ cm/minute horizontally" or even to "Display _1,600_ responses vertically and _1_ cm/minute horizontally," which might take better advantage of the researcher's computer–screen size while also accomplishing some of the previously laborious task of physically stacking the paper cumulative records atop each other; the resulting arrangement of the data can improve the control that the data exert over experimenter analysis responses.

Also, the digital resolutions available with a computer–generated cumulative record enable taking the response steps, which are otherwise so tiny that they are not readily visible to the naked eye, and zooming in on a selection of these response increments to see the actual step–up for each individual response. Such possibilities can further improve the control that the data exert on the analysis behaviors of experimenters, thereby increasing data–analysis precision.

In conclusion, beyond initially using twenty–first century equipment to replicate the original study, researchers may systematically extend the study of multiple, simultaneous responses and consequences—using the multiple selector–source procedure—to include the full range of basic contingencies that previous researchers studied only as single responses with single sources for consequences. These contingencies should include conditioning, extinction, evocation, shaping, chaining, fading, schedules, and punishment, all as a foundation for breaking new ground that might lead to new discoveries about the natural laws governing behavior.☘

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Table 1
Console Component Parts

How many	Part #	Item
2	# 607	Modular Cabinets (stacked)
1	# 261L–WH	light
3	# 122	Lindsley Plunger
3	# 224AM	Speaker, with:
3	# ANL–926	Programmable Audio Generator
3	# 221M	Light, with:
3	# 226A	4–Level Fader Control
3	# 621L–GR	Light
3	# 223AM	Speaker
3	# ???	Digital Counters
3	# 222M	Triple Stimulus (light) Display
3	# 610M	Lever [or # 118 Force Lever]

All these equipment parts are available through Med Associates of St. Albans, Vermont.☙

Submission Guidelines

Journal of Behaviorology **(previously known as *Behaviorology Today*) is the 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:**

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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, 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.

Stream of Energy: Using Elementary Principles of Behaviorology to Describe Progressive Neural Emotional Therapy (PNET)

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Ess Plus Behaviorological Counseling—Tucson AZ

Abstract

Social, cultural, and economical improvements continue to evolve in a manner that has allowed individuals to feel secure and safe from harm, free from illnesses, and experience an abundance of supporting necessities. Yoked to these conditions are the unavoidable demands of daily living. These demands, both external and internal, are often described as stress and may result in deleterious effects and manifestations commonly referred to as anxiety or emotions. An objective, standardized approach to minimizing the stress–related conditions is based on the principles of the natural science of human behavior or behaviorology. The PNET process includes parallel operant systems where conditioning occurs simultaneously across the endosystem (internal environment) and the ectosystem (external environment).

Cultural, economical, and social improvements continue to evolve in such a way that we are more protected, have extended life expectancies and improved health and wellness. These outcomes are correlated with the increased demands placed on us by our daily living conditions, increased levels of stress both minor and major, and the increased anxiety that often manifests as integral problems in medical, social, vocational and life conditions. This can often produce behavioral patterns described as criminal, anger, aggression, social isolation, and depression. Legal, social, and clinical reactions to these conditions often involve incarceration, isolation, ridicule, abuse, counseling, hospitalization, and medication as part of a seemingly endless list of programs and corrective interventions. Some of these intervention strategies may be, at best, partially successful, while others may actually exacerbate the problem.

When individuals who are beset by conditions similar to the above–mentioned are asked if they are happy with their current situations they often reply *"I'm not really happy with my life because of the demands placed on me on a daily basis. I am so stressed and feel that there is nothing I can do about it."* The correct response is that there is much that can be done. Some solutions can begin almost immediately and achieve desired results within a brief period of time while some solutions require extended interventions before the desired results are attained. Some problems may originate internally while other problems may originate and be maintained by external evocations and consequations. Any combination of these conditions may be in effect at any given moment. The one common factor and, it seems, the universal source of human discomfort are conditions that are generically referred to as stress. Stress sets the stage for physiological biochemical imbalances. It follows that any means of maintaining physiological balance would vastly improve one's life conditions which, in turn, would contribute to one's "happiness." Techniques and strategies designed to generate some form of relaxation in the human body have been shown to encourage beneficial behaviors that are incompatible with stress–induced anxiety (Lichstein, 1988).

In the current vernacular, relaxation has evolved from the early Eastern religions of Hinduism and Buddhism. Meditation was used as a precursor to contemplation, wisdom, altered states of consciousness, and relaxation. The Judeo–Christian systems used prayer and devotion to achieve similar outcomes as meditation, and eventually the Western culture emphasized relaxation as a means of achieving inner peace. From Hinduism of 5000 years ago to twenty–first century Western civilization, the search for inner peace and tranquility continues as this process

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Key words: anxiety, behaviorology, ectosystem, emotion, endosystemn, stress.

is maintained by intermittently successful outcomes. However, consistent with genealogical changes, this search for inner peace has expanded its tentacles with each generation so that after nearly 5000 years the number is staggering, with countless labels, descriptions, and explanations of how "inner peace" is achieved.

Process descriptors for achieving "inner peace" include—but are not limited to—meditation, yoga, acupuncture and acupressure, autogenic training, positive thoughts, music therapy, massage, prayer, mind–body therapies, imagery, biofeedback or alpha training, breathing retraining, relaxation, and hypnosis to name a few examples (The Burton Goldberg Group, 1997). Each process is credited with varying levels of treatment effectiveness but none gives an adequate description of this process from an objective perspective. Most descriptions and definitions are based on personal interpretations, references to influences of the soul or spirit, mental health explanatory fictions such as the mind or self–esteem, and inner–agent characterizations commonly expressed as "the devil made me do it."

The purpose of this paper is to describe the process and procedure of Progressive Neural Emotional Therapy (PNET), the description of which follows the stream of energy as it makes contact with the human body, enters the sensory system and, after multiple transformations within the internal environment, manifests as external behaviors. The stream of energy follows a path consistent with the behaviorological paradigm that has evolved over the last century. It is suggested here that both the internal and the external systems of functioning can be analyzed and explained by operant conditioning procedures.

Behaviorology, the natural science of human behavior, describes the relaxation experience as a behaved reaction to restructured (internal and external) environmental stimuli with the outcome maintained by contingent reinforcers. Behaviorology has been formally defined by Fraley (2008) as "a comprehensive discipline with philosophical, experimental, analytical, and technological components. It is a natural life science of functional relations between behavior and the environment in which that behavior occurs. Behavior is explained as a direct, natural, innervated reaction to environmental events, without any causal contribution by putative behavior–directing agents within the body" (p. 36). The elementary constituents of the basic behaviorology operant paradigm are schematically represented as:

S^D ———> B ———> C

A discriminative stimulus (S^D) evokes a behavior (B) which produces a consequence (C). "When members of the scientific community begin to talk and act alike with respect to their subject matter, it results more or less in a consensus called a paradigm. A paradigm facilitates the interaction of current members of the community and the entry of new members." (Vargas, 1991). The behaviorology paradigm was the basis for the formulation, development, and implementation of PNET. Questions continue to persist in discussions addressing how simply relaxing the external system of the human body could result in the reduction and termination of behaviors described as anxiety, depression, "mental illness", and other mood–related conditions. Other questions have been raised regarding the impact of PNET on medical conditions (Johnson, 2012). Still more questions surface when discussing the results of PNET as a therapeutic intervention for dysfunctional behaviors. Most of these questions have stimulated further clarification of the PNET process and procedures with the ultimate objective of encouraging research and experimental analysis. An attempt will be made to describe the stream of energy relative to the understanding, manipulation, and prediction of human responses that are directly or indirectly observable and/or measurable behaviors.

Consisting of billions of cells, the human body is composed of several levels of structural organization that begin with the molecular/chemical or lowest level of organization and proceed through the intermediate levels of cells, tissues, and organs to terminate ultimately at the highest or entire body level. These levels all interact with certain life processes that distinguish them from non–living things. These are the life processes of metabolism, responsiveness, and movement. Metabolism is the sum of all the chemical processes that occur in the body and provides the energy to sustain life. Responsiveness refers to the effectiveness of changes in the external or internal environment to produce responses. Movement includes motion of the whole body, individual organs, and single cells (Tortora and Grabowski, 1993).

The billions of cells that make up the human body function best under relatively stable conditions. This relative stability is known as homeostasis: a condition in which the body's internal environment remains within certain physiological limits despite external and internal environmental variations. Homeostasis is continually disturbed by stress, (i.e., any stimulus that creates an imbalance). The stress may originate in the external environment or may originate internally within the body. Fortunately, the human body has many regulating, in other words, homeostatic mechanisms that respond to stress and bring the body, externally and internally, back into balance.

Fraley (2008) has noted that,

> Another class of life processes is often described as the "behaviors" exhibited by the body, and, in that context, the sociocultural behaviors that concern behavior scientists are mostly operant. The behaviors in that class (a) are stimulated (i. e., triggered) by events in

> the behavior–controlling environment, many external to the body, (b) tend, in turn, to have effects on that environment, and (c) are finally rendered more or less probable by microstructural changes to the body that occur in reaction to those behavior–produced environmental changes (p. 1298).

Since its initial discovery, operant conditioning has referred to a set of principles and procedures describing how behaviors of living organisms are modified by the consequences of those behaviors. An entire science of human behavior has evolved around this concept (see Ledoux, 2014) and no limit has yet been reached in the application of these principles and procedures to living organisms. Operant conditioning has been used to define, describe, and predict human behavioral manifestations that are described as desirable, useful, needed, wanted, expected, and appropriate on one end of the sociocultural spectrum to behavioral manifestations of an opposite nature. Operant conditioning is an instrument used in the functional analysis of human behavior that has resulted in the prediction and control of countless behavioral manifestations. Skinner's (1938) original description of this form of conditioning was "if the occurrence of an operant is followed by presentation of a reinforcing stimulus, the strength is increased "(p. 21). The consequence of a behavior determines the frequency or rate of occurrence. Behaviors of concern in operant conditioning since its early days focused on external manifestations that are readily observable and impact the environment in such a way that such an impact can be directly observable and recorded. Operant behavior is defined by what the organism, in response to environmental stimulation, does to the external environment with little concern regarding the internal state of the organism. Skinner's (1938) comment with respect to the internal state of the organism was that "the facts of respondent behavior which have been regarded as fundamental data in a science of behavior are not to be extrapolated usefully to behavior as a whole nor do they constitute any very large body of information that is of value in the study of operant behavior" (p. 438). The priority of operant conditioning is the relationship between a behaving organism and its external environment, and here "external" refers to all aspects of the environment from "the skin outward."

Ectosystem (External Environment)

The tact "environment," according to Martin and Pear (2003) "refers to the people, objects, and events currently present in one's immediate surroundings that impinge on one's sense receptors and that can affect behavior. The people, objects, and events that make up a person's environment are called stimuli" (p. 6). When referring to the "external environment," the distinction is made between the environment outside the person from the internal environment that refers to conditions within the person. The external environment and its related characteristics such as stimulus, response, consequence, and other associated parameters are identified as components of the ectosystem. The use of the prefix "ecto" eliminates the repeated and cumbersome use of the term "external" when differentiating the external environment from the internal environment. The prefixes "ecto" and "endo" have been used by biologists to describe zygotic formulation of external (ectoderm) and internal (endoderm) membranes. These prefixes are used to describe the PNET external paradigm (ectosystem) and internal paradigm (endosystem). The conversion terminology for the ectosystem is as follows:

external environment = ectovironment
external stimulus = ectostimulus
external behavior = ectobehavior
external consequence = ectoconsequence

Historically the repeated use of "external" seemed redundant because operant processes dealt almost exclusively with external behaviors and there was no need to repeat the word "external" since it was understood that "internal" was not to be discussed. The internal behaviors were unobservable and reflexive in nature and therefore, were considered to be almost exclusively within the realm of physiology—*never to darken the operant door!* This may have been a truism during the early years but the latter part of the last century saw growth in the clinical application of operant procedures with behaviors that were fundamentally internal in nature. Concerns with improvement in wellness and health, medical conditions, social family emotional interactions, "mental" health practices, and stress/anxiety experiences have caused a major shift toward behaviorological practices and procedures to explain, describe, and standardize remediation strategies and techniques.

Endosystem (Internal Environment)

In order to discuss the internal processes from a behaviorological perspective, it may be useful to follow the stream of energy from the ectovironment to the moment of contact with the human sensory system, through the sensory input, through the endobehavioral process, and ultimately to the endoreinforcing consequation while simultaneously impacting the ectomotor behavior.

The internal environment or "inside the skin" environment is referred to as the endovironment. The

use of the prefix "endo" does away with the repeated and cumbersome use of the term "internal" when referring to the internal activities of the human body and differentiating it from the ectovironment. The conversion terminology for the endosystem is as follows:

internal environment = endovironment
internal stimulus = endostimulus
internal behavior = endobehavior
internal consequence = endoconsequence

In the past, the term "internal" had limited use in behavioral experimental studies. Behaviorological clinicians were placed in the position of avoiding explanations for endosystemic processes. One was expected to assign explanations of internal or emotional conditions and disorders to respondent conditioning. Examples of these emotional behaviors include anxiety and stress–related disorders that often resulted in medical–psychiatric interventions. When asked to explain these conditions further, the respondent paradigm seemed woefully inadequate. The importance of operationally describing the human internal machinations can no longer be ignored by encasing it in the proverbial physiological "black box."

Human emotional and neural responses should not be relegated to an exclusive solitary explanation of reflexive causation while denying operant influences that would impact its rate, intensity, and duration of occurrence. The task of assigning operant parameters to endosystemic manipulations seems daunting but one should not be dissuaded from pursuing scientific evidence simply because the task is too difficult or unpopular.

Ectosystem and Endosystem Interface

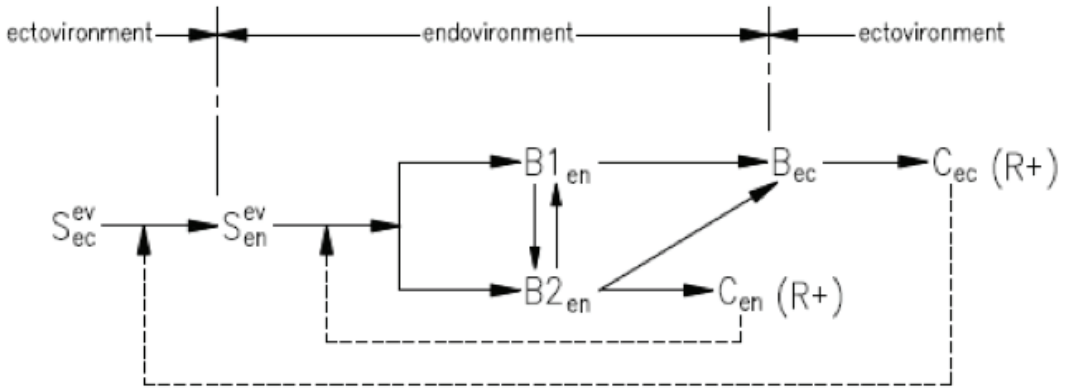
Human emotion is the end product of the connecting relationship between relevant energy forces in the ectovironment and the sensory input modalities within the human endosystem. The connecting relationships of emotional processes were addressed by Ledoux (2012) when he stated that "…to deal scientifically with emotion requires the different analytical levels of these two disciplines [physiology and behaviorology]. *Emotion* refers to a release of chemicals into the bloodstream (an area of physiology) that external or internal stimuli elicit (an area of behaviorology). That change in body chemistry produces the reactions called *feelings"* (p. 61). Relevant energy inputs in such forms as photons, molecular activities, sound waves, and cutaneous pressures are experienced as sensations in living organisms. Figure 1 diagrams the general interface between the ectosystem and the endosystem.

Sensation is the awareness of ecto– and endostimuli. The nature of the sensation and the type of response evoked by the sensation vary with the status of the central nervous and endocrine systems. It is within the endosystem that the sensation is transduced into precise conditions for identification and localization. Each type of sensation is described by a sensory modality and collectively referred to as the general senses. The most familiar general senses include the cutaneous, olfactory, gustatory, visual, and auditory modalities. Sensations are experienced when stimulation, transduction, conduction, and translation are present.

- *Stimulation* is present in the ectosystem, when there is an ectostimulus or change in the ectovironment capable of activating specific sensory modalities. Stimulation is present in the endosystem when there is an endostimulus or change in the endovironment capable of activating certain neuronal–hormonal units.
- *Transduction* is present in the ectosystem when there is an active response to the ectostimulus at a sensory receptor where it is converted to a receptor potential. For the endosystem, an endoresponse to an endostimulus must occur at a neural–hormonal unit and be converted to a bio–electrochemical potential.
- *Conduction* occurs within the endosystem. Energy from the ectosystem is transduced into the endosystem's electrochemical, biochemical, and neural activities all of which relay data to the central nervous system (CNS). Simultaneously, the endocrine or hormonal system is activated.
- *Translation* is present when the CNS neural impulses coupled with hormonal displacement translate the endosystemic activity into ectomotor performance and endoemotive sensations.

Behaviorological Analysis of Progressive Neural Emotional Therapy (PNET)

PNET is a behavior–realignment process where the principles and practices of the natural science of behaviorology are used in a step–by–step method to achieve ectomotoric and endoemotive homeostasis. The PNET process is composed of four discrete phases (Preparatory, Induction, Imagery, and Transfer) and has been presented in detail in a recent article in *Behaviorology Today* (Ferreira, 2012). The fundamental tenets of the composition and function of the human body relate to the levels of structural organizations described as chemical, cellular, tissue, organ, and the whole person. These systems must work in a synchronized cooperative fashion in order to maintain health and wellness. The endosystem must maintain a balance notwithstanding the countless ectosystemic variations commonly referred to as external stress. This balance between the structural organizations and their cooperative functions has notable similarities to



S^{ev}_{ec} = evocative ectostimulus

S^{ev}_{en} = evocative endostimulus

$B1_{en}$ = endobehavior in neuro–chemical system

$B2_{en}$ = endobehavior in glandular–biochemical system

B_{ec} = ectobehavior (ectomotor)

C_{ec} = ectoconsequence

C_{en} = endoconsequence

(R+) = positive reinforcer

Figure 1: Ectosystem and Endosystem Interface Paradigm

the balance between the motor activities and the external stressors. Physiologists call such relative balance or stability "homeostasis." When this homeostatic condition is disrupted or "stressed" whether endosystemically or ectosystemically, the body or portions thereof experiences a state of discomfort commonly described as uneasiness, pain, restlessness, edginess, nervousness, and anxiety. The return to a balanced state or homeostasis of the entire person must rely on the interdependent processes of the ecto– and endosystems. Neither can maintain a stable system independent of the other so both systems are of equal value to health and wellness (Nowicki, 2004). Both systems function under a model that can be described by the now familiar operant paradigm. That is, the human homeostatic condition is maintained through the interface of the ectosystem with the endosystem. Each of the parallel operant processes can be behaviorologically analyzed.

Behaviorology is the natural science that accounts for the corrective and progressive results achieved with the PNET process where the relaxation experience is a behaved reaction to specifically restructured ectovironmental stimuli. The relaxation experience is a direct, natural response to both ecto– and endovironmental events without any causal contributions from putative agents within the body. The body mediates the manifestation of behavior, which is reactive to the total environmental episode. Figure 2 shows the fit of the conditioning instances of PNET to the ecto–endo interface.

Quality of life advances have given us vastly improved means for communication, transportation, satisfaction of personal needs, improved health, extended life expectancy, reduced labor demands, and increased creature comforts. *Life is good!*

But… there is a price to be paid for these amenities. One of the most costly of these price tags is generalized anxiety, that endoemotive by–product of the innumerable stressors encountered in the daily experiences of life. Anxiety and other endoemotive experiences are often associated with medical issues and, to that extent, impact everyone. "According to the Mind/Body Medical Institute at Harvard University, 60 to 90% of all medical office visits in the United States are for stress–related disorders" (Alternative Medicine, July/August, 2013). Over the centuries there has evolved many techniques and procedures oriented toward resolving some of these endoemotive experiences. Unfortunately, most were based on mystical, psychical, and agential explanatory fictions that endure to this day. Despite evidence to the contrary, these superstitious behaviors persist, because their manifestations are under the control of serendipitous intermittent schedules of reinforcement. This may have contributed mightily to the uncritical

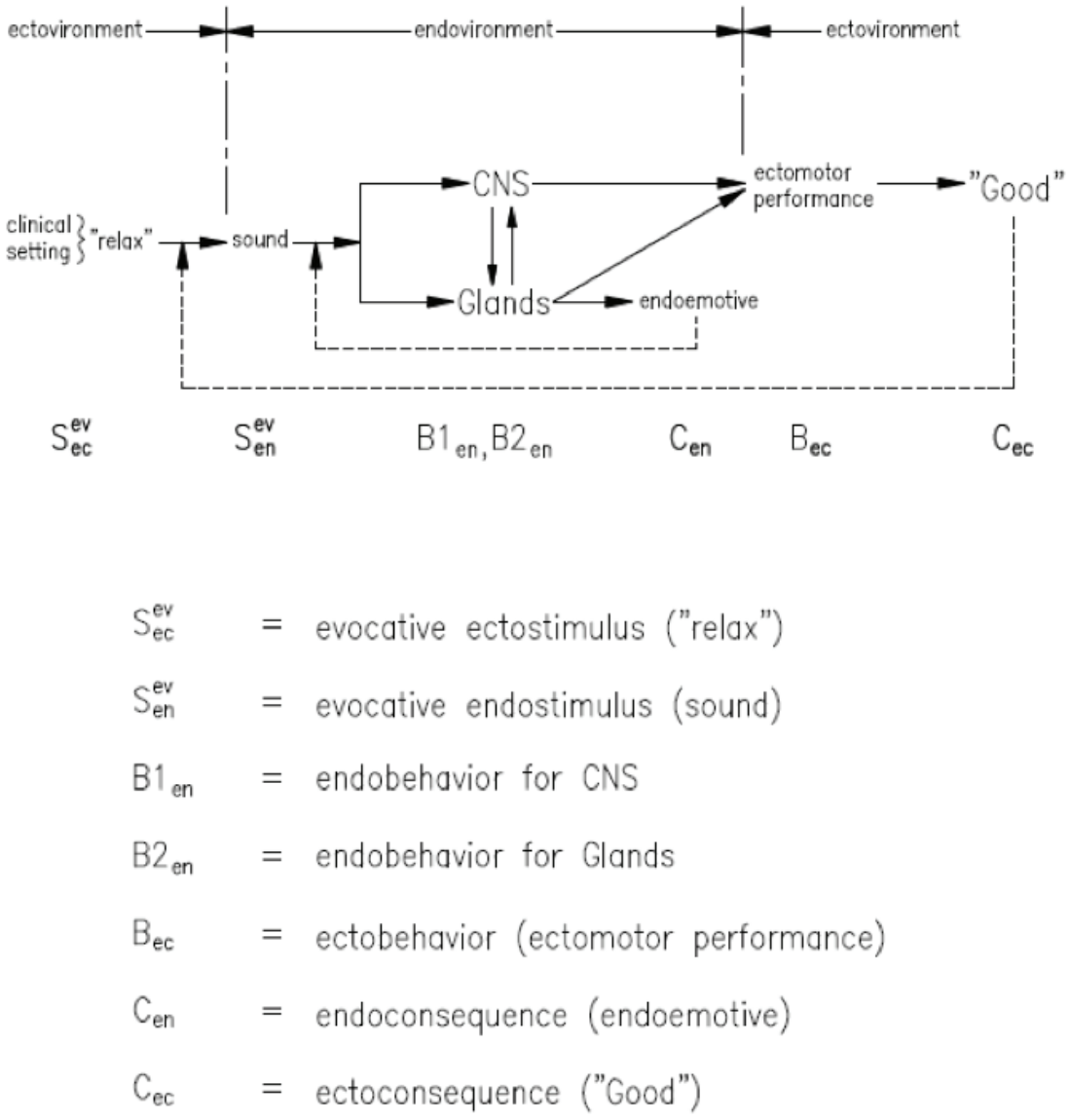


Figure 2: Behaviorological Analysis of Progressive Neural Emotional Therapy (PNET)

and unsubstantiated explanations for many of today's dysfunctional sociocultural behaviors.

The natural science of human behavior would go far in providing a clear and convincing therapeutic standard for resolving many of these endoemotive responses. The behaviorological analysis of PNET suggests that this form of therapeutic intervention would have a universal application for rectifying countless ecto– and endosystemic dysfunctional conditions as well as a means of developing, maintaining, and improving desirable behaviors.

This author's clinical experience has suggested beneficial PNET applications with individuals manifesting dysfunctional behaviors variously described as "… emotional problems, psychiatric disorders, anxiety–stress–panic attacks, behavior excesses and deficits, attention deficit disorders with hyperactivity." In addition, conditions of co–morbidity (medical—behavioral) that were addressed effectively with PNET intervention include "…insomnia, common warts, acute intermittent porphyria, anger/rage, Tourette's Syndrome, and cerebral palsy" (Ferreira, 2006). Clinically effective results have been experienced when PNET as an independent variable was used as part of treatment strategies for cancer, multiple sclerosis, neuropathy, insomnia, post–surgical pain, pregnancy, hypertension, diabetes, irritable bowel syndrome, migraine headaches, chronic regurgitation, epilepsy, and autism. PNET provides a safe, effective method for behavioral realignment for human ecto– and endosystems.

Those outcomes can serve as a catalyst for further experimentation with controlled studies while serving as an impetus for more clinical–educational intervention strategies. PNET, with its potential for universal applications, can serve as a counterbalancing constructive consideration for addressing adverse by–products of agential explanations. There have been occasional references to case studies so one would be well–advised to remember that any interpretations with cause–and–effect conclusions must be made with extreme caution but, in doing so, the value of inherent or any reasonable interpretational analysis of anecdotal reports must not be overlooked. Anecdotal presentations often provide interesting data, encourage creative experimental research, and promote the development of technical and innovative therapeutic techniques.☘

But one of the most important lessons learned in the centuries since Copernicus is that a scientific model doesn't have to explain everything to be a good model.—John Gribben, The Scientist, 2004.

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The TIBI 27th Behaviorology Anniversary Convention

In addition to focusing on concepts, research, demonstrations, and interventions of interest to human service practitioners, TIBI will have a range of behaviorology–related items available, including the latest books and recordings:

❧ **The CD *August 1988 Public Radio Interview of the Organizers of the First Behaviorology Convention*, and**

❧ **The book *Running Out of Time—Introducing Behaviorology to Help Solve Global Problems***

By early February 2014, that book will also be available through local bookstores or from the main distributor, **Direct Book Service, Inc.**, at 800–776–2665, who will likely answer the phone with "Dogwise," because their most popular speciality involves books about our canine friends; several of their books already specifically apply the laws of behavior that *Running Out of Time…* systematically introduces; see the Editorial in this issue for more details.

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 201: *Non–Coercive Child Rearing Principles and Practices.**
Volume 7, Number 2 (Fall 2004): BEHG 355: *Verbal Behavior I.**
Volume 8, Number 1 (Spring 2005): BEHG 400: *Behaviorological 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: *Behaviorological 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.*
Volume 10, Number 1 (Spring 2007): BEHG 120: *Non–Coercive Companion Animal Behavior Training.*

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 120: *Non–Coercive Companion Animal Behavior Training:*
Volume 10, Number 1 (Spring 2007).
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.

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After its first 10 years online, TIBI has completely renovated its web site. Navigation is far easier than on the old site. News announcements not only appear regularly, but they are also archived. You can still visit the original—and now unchanging—site, by clicking on "First 10–years Archive" under the HOME menu. Other main menu categories include NEWS, GENERAL, JOURNAL, BOOKS, EDUCATION, and CONTACTS. Each of these includes any necessarily related submenus. Check them all out!

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$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:

CATEGORY	DUES (in US dollars)*
Student member	The lesser of 0.1% of annual income, or $20.00
Affiliate member	The lesser of 0.2% of annual income, or $40.00
Associate member	The lesser of 0.3% of annual income, or $60.00
Advocate member	The lesser of 0.4% of annual income, or $80.00

Member of Board of Directors:

For 2013: The lesser of 0.6% of annual income, or $200.00

Increases *and stabilizes* in 2014 at: $300.00

*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:

Office Phone #:

Fax #:

E-mail:

Degree/Institution:***

Membership (category): ☐

Amount enclosed: US$

Home Address:

Home 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:

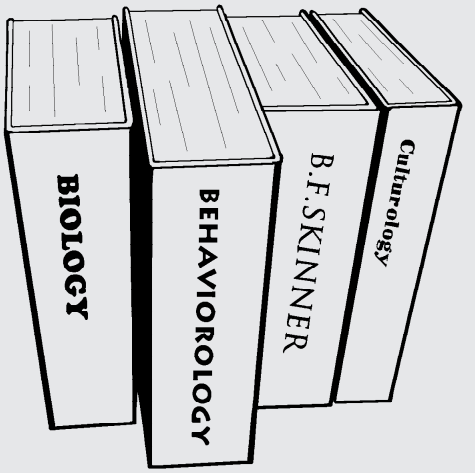
*TIBI / TIBIA Purposes**

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.)

Journal of Behaviorology

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