## ABOUT 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 BEHAVIOR–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.*

AMONG BEHAVIOR SCIENTISTS WHO RESPECT THE PHILOSOPHY OF NATURALISM, TWO MAJOR STRATEGIES HAVE EMERGED THROUGH WHICH THEIR RESPECTIVE PROPONENTS WOULD HAVE THE NATURAL SCIENCE OF BEHAVIOR CONTRIBUTE TO THE CULTURE. ONE STRATEGY IS TO WORK IN BASIC NON–NATURAL SCIENCE UNITS AND DEMONSTRATE TO THE OTHER MEMBERS THE KIND OF EFFECTIVE SCIENCE THAT NATURAL PHILOSOPHY CAN INFORM. IN CONTRAST, BEHAVIOROLOGISTS ARE ORGANIZING AN ENTIRELY INDEPENDENT DISCIPLINE FOR THE STUDY OF BEHAVIOR THAT CAN TAKE ITS PLACE AS ONE OF THE RECOGNIZED BASIC NATURAL SCIENCES.

# CONTENTS

CONTACT TIBI FACULTY *&* BOARD OF DIRECTORS AT
 www.behaviorology.org or individually:

Lawrence E. Fraley, Ed.D.* (Retired, Chair)
 *Professor, West Virginia University at Morgantown*
 Route 1 Box 233A / Reedsville WV 26547
 lfraley@citlink.net (304) 864–3443 or 864–6888

Glenn I. Latham, Ed.D.* (1931–2001)
 *Professor, Utah State University at Logan*
 MEMBER IN PERPETUITY

Stephen F. Ledoux, Ph.D.* (Treasurer)
 *Professor, State University of New York at Canton*
 ledoux@canton.edu
 Faculty web page: Click "Ledoux" under
  "Faculty Directory" at www.canton.edu

---

*TIBI CO–FOUNDER

AS PART OF THE ORGANIZATIONAL STRUCTURE OF THE INDEPENDENT NATURAL SCIENCE OF BEHAVIOR, *The International Behaviorology Institute* (TIBI), A NON–PROFIT PROFESSIONAL ORGANIZATION, EXISTS TO FOCUS BEHAVIOR-OLOGICAL PHILOSOPHY AND SCIENCE ON A BROAD RANGE OF CULTURAL PROBLEMS. TIBI SPONSORS AN ASSOCIATION (THE TIBI ASSO-CIATION, OR TIBIA) FOR INTERESTED PEOPLE TO JOIN, SUPPORTING THE MISSION OF TIBI AND PARTICIPATING IN ITS ACTIVITIES. AND *Behaviorology Today* IS THE MAGAZINE/NEWS-LETTER OF THE INSTITUTE. THE GUEST AND STAFF WRITERS OF *Behaviorology Today* PROVIDE AT LEAST MINIMALLY PEER–REVIEWED ARTICLES AS WELL AS, ON OCCASION AND WITH EXPLICIT DESIGNATION, FULLY PEER–REVIEWED ARTICLES. THEY WRITE ON THE FULL RANGE OF DISCI-PLINARY TOPICS INCLUDING HISTORICAL, PHILOSOPHICAL, CONCEPTUAL, EDUCATIONAL, EXPERIMENTAL, AND TECHNOLOGICAL (APPLIED) CONSIDERATIONS. PLEASE JOIN US—IF YOU HAVE NOT ALREADY DONE SO—AND SUPPORT BRINGING THE BENEFITS OF BEHAVIOROLOGY TO HUMANITY. (CONTRIBUTIONS TO TIBI OR TIBIA ARE TAX–DEDUCTIBLE.)❧

# The First Baby Tender

## B.F. Skinner

### *Harvard University*

[B.F. Skinner provided this short article to introduce a 1987 book by Stephen F. Ledoux and Carl D. Cheney that described their building of Aircribs (*Grandpa Fred's Baby Tender, or Why and How We Built Our Aircribs*). The Aircrib design in this book followed a design that Dr. Skinner had made and modeled but not actually constructed. While that book is out of print, the introduction is reprinted here with permission as a service to bring to the attention of new generations of readers this long-standing behaviorological contribution to childcare, a regular topic of these pages.—Ed.]

*I* designed what we called the baby tender as a laborsaving device. We wanted to have a second child, but my wife said she rather hated the chores of the first year or two. I suggested that we simplify the care of a baby. All that was needed during the early months was a clean, comfortable, warm, and safe place for the baby, and that was the point of the baby tender. I started to build it about the same time we started the baby, and in spite of war–time shortages finished it just before our daughter Deborah was born.

As soon as she came home from the hospital, we put her in the baby tender. We discovered immediately that the labor we saved was far less important than the advantages for her. She slept on a tightly stretched canvas covered with a sheet (later replaced with a single plastic cloth that felt rather like linen). There were no nightclothes, sheets, or blankets, and she wore only a diaper. There was no danger that she would smother, as there occasionally is in a standard crib. She breathed clean air, which was humidified and maintained at just the right temperature. She was free of colds for many years, and I am inclined to think that it due primarily to the warm humid air she breathed as a child. In the winter in a northern climate a house is about 30 degrees below body temperature, and the air the baby breathes is chilled further by evaporation from moist surfaces in the air passages. It is possible that the superficial layers of the bronchi and lungs grow as much as 40 degrees below body temperature, and that could make a great difference. The species originated in the tropics, where warm, moist air was standard, and there may not have been enough time for further evolutionary changes.

The space was quiet, and Deborah was free to move about and take comfortable positions at any time of day or night. She soon began to exercise much more vigor-ously than would have been possible in a standard crib, and she grew very strong. Our pediatrician commented on her unusual strength. Her skin stayed dry, and she never had any diaper rash. She never objected to being put into the baby tender and almost never cried.

Her rapid physical development was matched by be-havioral gains. She was free to explore all parts of the space and there was a large window through which she could watch life around her. At one point she seemed to pass through a phase in which she used her feet prehensilely. Another couple who made and used a baby tender sent us a photograph of their baby holding its bottle with its feet while it drank. I made toys which Deborah used very early. By pulling a ring that hung from the ceiling, she produced a whistle. By twisting a T–bar that hung from the ceiling, she made small banners spin. Later, by pulling a ring she operated a music box, tone by tone.

She was not socially isolated. She was taken out for feeding and play, of course, and we could allow the neighborhood children to talk and gesture to her through the window without passing on their viruses. The labor we saved not only made it easy for us to treat her affectionately but encouraged us to spend more time with her. She spent a lot of time outside the baby tender, especially as she grew older. Eventually she slept in it only at night and for naps.

During her second and third years, when we could predict her bowel movements, she slept without clothing. Urine passed through the plastic cloth (which could be quickly washed and dried) into a tray to be thrown out the next morning. She learned to postpone urination, in part, I think, because of the consequences. Urination in a diaper is immediately followed by a pleasurable warmth; it is only after several minutes that a damp dia-per grows cold and uncomfortable. Without a diaper uri-nation immediately moistens the skin and chills it. Deborah began to go for long periods of time without urinating, and by the time she first slept in a bed she had learned to keep herself dry and never wet her bed. All the supposed psychological problems connected with toilet training were avoided.

I have seen many young people who spent part of their first years in similar spaces, and most of them were rather tall and strong. It would be extraordinary if those first years of rapid growth could have made that kind of difference, but it is certainly something worth exploring further.

The response to my article in The Ladies Home Jour-nal, written when Deborah was nine–months–old, drew hundreds of letters asking where a "baby tender" could be purchased or how one could be made. I sent out hundred of crude instructions. There were only a very few critical letters. I have never found anyone who, upon seeing a baby in an Aircrib, did not immediately think it was a wonderful idea. But misunderstandings began to spring

up and were widely circulated. The *Journal* had given my article the title "Baby In A Box" and some of the misunderstanding came from a confusion with the equipment used in operant research. Misunderstandings are still common. Here is a sample from an article published by a reputable psychologist: "In the late '40s, Professor Skinner invented the 'aircrib,' a Skinner box for babies. It was a large, soundproof, germproof, air–conditioned box for giving children mechanical care for the first two years of life." Every statement in the passage is wrong. I designed and build the box in 1944. It is not an experimental apparatus. It is not soundproof; Deborah was shielded from loud noises, but we could hear her at all times. It is not germproof, although it was a kind of shield against sudden large doses of infection. "Air–conditioned" suggests cooling, but the air was only warmed. It is no more mechanical than a standard crib, and there was nothing mechanical about the care we gave our child. Deborah may have spent a bit more time in the Aircrib than she would have spent in a standard crib, because she was freer and more comfortable there, but in her second year she merely slept in it, at night and for naps. (Perhaps I should add that rumors that she committed suicide or became psychotic are equally wrong. Now 43 [in 1987—Ed.], she is a happily married, talented artist and writer.)

It is possible to build a better world for a baby and the baby tender was a step in that direction.

B.F. Skinner
January, 1987.❖

## References

Skinner, B.F. (1945, October). Baby in a box. *The Ladies Home Journal.* [Also in Skinner, B.F. (1999). *Cumulative Record—Definitive Edition* (pp. 613–620). Cambridge, MA: B.F. Skinner Foundation.]

*Editor's note* (included in the 1987 book): The Skinners' first daughter, Julie, is also happily married, is engaging in a successful career as a Behaviorologist, and has used an aircrib with all of her own children.

*Editor's note* (**not** included in the 1987 book): March 20, 2004, is the 100th anniversary of B.F. Skinner's birth.℃℥
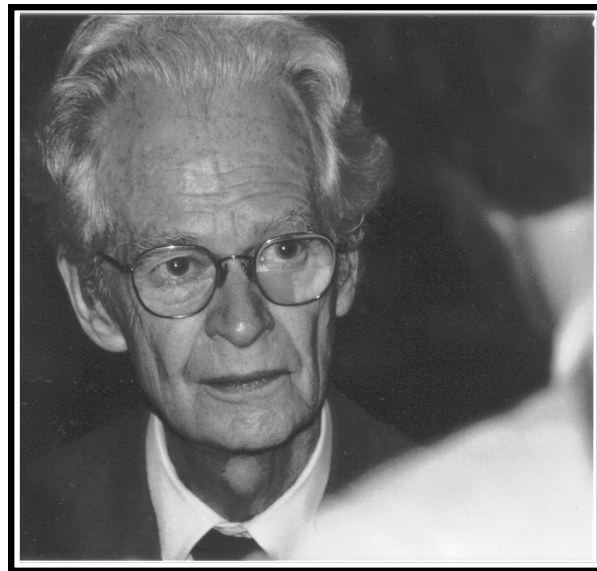


Photo by Stephen F. Ledoux

# Burrhus Frederic Skinner

The original behaviorological scientist (1904–1990)
(Shown here in conversation at the 1982 ABA convention.)

# TIBI Online Syllabus for BEHG 475: Verbal Behavior II

## Stephen F. Ledoux

### *SUNY–Canton*

[This is another installment in the series of syllabi for TIBI's online courses. Each syllabus appears in *Behaviorology Today* basically in the same form as it appears online. The series continues whenever there are syllabi that have yet to be printed, or that require reprinting due to substantial revisions. Locate additional syllabi through the *Syllabus Directory* at the back of this issue.—Ed.]

*Note #1:* This syllabus contains some notes that supplement the more traditional syllabus parts. Each note is numbered for convenient reference. Some notes, like this one, have multiple paragraphs.

*This syllabus is a long document.* It is longer than a syllabus for a face–to–face course as it contains material that the professor would otherwise cover in person. *Hence it was designed to be printed out for reading!* Furthermore, it was designed to be used *as a task check–off list.* Please print it out and use it these ways.

Indeed, aside from a simple web–log assignment, the only activity in this course for which you need access to a computer *is* to print out this syllabus and use it to see what this course covers and how it works, and to follow the directions to complete this course. This is a matter of access, student access to education, so that everyone who wants this course can take it regardless of whether they own several computers or only have access to one in their local library or in a friend's home.

Students can, if they wish, study the topics of this course free of charge, perhaps to fulfill their own interests. They would do so simply by completing the activities described in this syllabus.

Students can also study the topics of this course for TIBI (The International Behaviorology Institute) credit, perhaps toward a TIBI certificate. They would do so by paying the necessary fee to be assigned a professor to provide feedback on, and assessment of, their efforts. This course can be part of several TIBI certificates; contact TIBI or visit www.behaviorology.org for details.

Also, students can study the topics of this course for regular academic credit; they would do so by contacting any accredited institution of higher education that offers behaviorology courses accepted by TIBI, such as the State University of New York at Canton (SUNY–Canton) at www.canton.edu which is SUNY–Canton's web site. At SUNY–Canton this course may be offered as *SSCI 480: Advanced Verbal Behavior Analysis and Applications.* TIBI automatically accepts A or B grades from the academic–credit version of this course as equivalent to its own course toward its certificates (and C and D academic–credit grades can be remediated through TIBI for TIBI credit; contact TIBI for details). Alternatively, the work done completing this course through TIBI may make taking the course for academic credit easier; ask the professor who teaches SUNY–Canton's equivalent course about this.

The parts of this syllabus cover many topics. While the headings may be different, these include (a) the course content and objectives, (b) the text, study, and assessment materials, (c) the grading policy, (d) the necessary work–submission methods and professor feedback, and (e) the study–activity sequence and completion timelines.

*Note #2:* The prerequisite for this course is BEHG 355: Verbal Behavior I. If you have not had this prerequisite course (or its academic–credit equivalent such as SSCI 380: Introduction to Verbal Behavior Analysis and Applications, from SUNY–Canton), then you need to take it before taking this course for TIBI credit.

## Course Description

*BEHG 475: Verbal Behavior II.* Based on the principles and practices of the natural science of behavior, this course takes students through the full range and depth of verbal behavior analysis especially as presented by B.F. Skinner in his original book on the topic. Along with extensive applications to literature concerns and examples, and more detailed explanations of exceptions, ambiguities, controversies, and implications (all with a comprehensive set of examples), this course covers five areas: (a) the functional analysis of verbal behavior (including the unit of verbal behavior, vocal behavior, the listener, and the verbal episode), (b) basic variables controlling verbal behavior (including the audience relation and those that produce the elementary verbal operants of mands, tacts, etc.), (c) multiple variables controlling verbal behavior (including multiple audiences, contingencies, stimuli, formal and thematic variables, supplementary stimulation, fragments, and blends), (d) the manipulation of verbal behavior (including autoclitics, grammar, syntax, and composition), and (e) the production of verbal behavior (including self editing, scientific and logical verbal behavior, and thinking).

*Note #3:* To check out other behaviorology courses offered by TIBI, visit their locations on the TIBI web site (www.behaviorology.org).

To check out other behaviorology courses offered by SUNY–Canton, see the list and descriptions—and in some cases, the syllabi for the asynchronous versions—on the faculty web page of the professor who teaches them (which currently is Dr. Stephen F. Ledoux; click Ledoux in the faculty directory at www.canton.edu).

## Course Objectives

The main objective of the course is to expand the student's behavior repertoire in relevant areas of behaviorological course content. The student will:

❧ Summarize the functional analysis of verbal behavior (including the unit of verbal behavior, vocal behavior, the listener, the verbal episode, and the verbal community);

❧ Systematize the basic variables controlling overt and covert verbal behavior (including the audience relation and those that produce the elementary verbal operants of mands, tacts, etc.);

❧ Describe multiple variables controlling verbal behavior (including multiple audiences, multiple contingencies, multiple stimuli, formal and thematic variables, supplementary stimulation, fragments, and blends);

❧ Demonstrate the manipulation of verbal behavior (including autoclitics, grammar, syntax, and composition);

❧ Compare types of verbal behavior production (including self editing, scientific and logical verbal behavior, poetry, literature, non–fiction, and thinking); and

❧ Elaborate a range of examples of ordinary verbal behavior phenomena as well as exceptions, ambiguities, controversies, implications, and applications.

## Additional Objectives

❧ Successful, A earning students will use (at an accuracy level of 90% or better) basic disciplinary terminology both when discussing behaviorological knowledge, and when applying behaviorological skills, relevant to verbal behavior analysis and applications.

❧ Such successful students will also ask questions, seek answers, converse about, and act on the uses and benefits of this discipline for humanity.

❧ Such successful students will also behave more effectively in other ways with respect to themselves and others.

## Required Materials (in their order of use)

❧ Skinner, B.F. (1957). *Verbal Behavior.* New York: Appleton–Century–Crofts. Reprinted, 1992, Cambridge, MA: The B.F. Skinner Foundation (ISBN 0-87411-591-4).

❧ Ledoux, S.F. (in progress). *Study Questions for B.F. Skinner's "Verbal Behavior."* Canton, NY: ABCs.

❧ Fraley, L.E. (2004). *General Behaviorology: The Natural Science of Human Behavior.* The chapter on "Verbal Behavior." (Also printed in the four issues of volumes 7 and 8 of *Behaviorology Today.* Contact TIBI for options on obtaining this material, along with its study questions.)

## Recommended Materials

These are references to materials that, while *not* required for the course, may also be of interest to those who wish to go deeper into the course topics and extensions:

❧ Cautela, J.R. (1994). General level of reinforcement II: Further elaborations. *Behaviorology, 2* (1), 1–16.

❧ Chomsky, N. (1959). *Verbal Behavior* by B.F. Skinner. *Language, 35,* 26–58.

❧ Eshleman, J.W. & Vargas, E.A. (1988). Promoting the behaviorological analysis of verbal behavior. *The Analysis of Verbal Behavior, 6,* 23–32.

❧ Fraley, L.E. (1996). Verbal behavior in the measuring process. *The Analysis of Verbal Behavior, 13,* 123–126.

❧ Ledoux, S.F. (2002). Increasing tact control and student comprehension through such new postcedent terms as added and subtracted reinforcers and punishers. In S.F. Ledoux. *Origins and Components of Behaviorology—Second Edition* (pp. 199–204). Canton, NY: ABCs.

❧ Ledoux, S.F., Michael, J., & Miguel, C. (2002). *An Introduction to the Elementary Verbal Operant Relations in the Verbal Behavior Analysis Component of Behaviorology Plus Some Initial Implications and Applications for Foreign Language Teaching.* Canton, NY: Stephen F. Ledoux. [Contact TIBI for options on obtaining this material.]

❧ MacCorquodale, K. (1969). B.F. Skinner's *Verbal Behavior:* A retrospective appreciation. *Journal of the Experimental Analysis of Behavior, 12* (5), 831–841.

❧ MacCorquodale, K. (1970). On Chomsky's review of Skinner's *Verbal Behavior. Journal of the Experimental Analysis of Behavior, 13* (1), 83–99.

❧ Michael, J.L. (1982). Distinguishing between discriminative and motivational functions of stimuli. *Journal of the Experimental Analysis of Behavior, 37,* 149–155.

❧ Peterson, N. (1978). *An Introduction to Verbal Behavior.* Grand Rapids, MI: Behavior Associates. [This book may be available online. Contact TIBI regarding this and other options.]

❧ Premack, D. (1970). A functional analysis of language. *Journal of the Experimental Analysis of Behavior, 14,* 107–125.

❧ Schlinger, H. & Blakely, E. (1987). Function–altering effects of contingency–specifying stimuli. *The Behavior Analyst, 10,* 41–45.

❧ Sidman, M. (1986). Functional analysis of emergent verbal classes. In T. Thompson & M. Zeiler (Eds.). *Analysis and Integration of Behavioral Units* (pp. 213–245). Hillsdale, NJ: Erlbaum.

❧ Sidman, M. (1994). *Equivalence Relations and Behavior: A Research Story.* Boston, MA: Authors Cooperative.

❧ Skinner, B.F. (1953). *Science and Human Behavior.* New York: Macmillan. (Paperback: Free Press, 1965.)

❧ Stromer, R. (1991). Stimulus equivalence: Implications for teaching. In W. Ishaq (Ed.). *Human Behavior in Today's World* (pp. 109–122). New York: Praeger.

❧ Vargas, E.A. (1988). Verbally–governed and event–governed behavior. *The Analysis of Verbal Behavior, 6,* 11–22.

❧ Vargas, J.S. (1990). Cognitive analysis of language, and verbal behavior: Two separate fields. In L.J. Hayes & P.N. Chase (Eds.). *Dialogues on Verbal Behavior* (pp. 197–201). Reno, NV: Context Press.

*Note #4:* The simplest way to obtain required or recommended books is to order them through the publishers, including *ABCs* at 315–386–2684, and The B.F. Skinner Foundation at PO Box 825, Cambridge, MA 02138 USA. They may also be available through the online bookstore at www.behavior.org which is run by the Cambridge Center for Behavioral Studies.

The simplest way to access required or recommended articles is to seek them through your local community or college library. Alternatively, the parent journals may have web sites on which they make the articles available online. Visit www.behaviorology.org for some relevant links.

Also, this course is grounded in the Shaping Model of Education which is informed by behaviorological science (rather than the Presentation Model of Education which is informed by psychology). In the shaping model teaching is not seen as mostly talking (nor is learning seen as mostly listening). Instead, teaching is the scientifically grounded design, arrangement, and application of educational materials, methods, and contingencies in ways that generate and maintain small but continuously accumulating behaviors the short and long range consequences of which are successful in producing an ever wider range of effective responding (i.e., learning) on the part of the student.

## Grades

Grading policy does not involve curves, for you are not in competition with anyone (except perhaps yourself). That is, all students are expected to produce the academic products demonstrating that they have, individually, achieved at least mastery of the subject matter, if not fluency. Therefore, all students are expected to earn an A or a B (although inadequate products will produce a lower result that requires remediation before it can become a passing grade). Also, all students will receive the grades they earn. This holds even if the expectation for which the course is designed—that all students earn *As*—is met: If all earn *As*, then all receive *As*.

Passing grades are limited to A and B, and are earned according to the amount of assigned work that is successfully completed:

Earning an A consists mainly of satisfactorily completing 90% or more of the work on all assignments.

Earning a B consists mainly of satisfactorily completing more than 80% of the work on all assignments (but not more than 90% on them).

For convenience a point–accumulation system is invoked to keep track of progress through the course. Each of the 12 assignment on the *Verbal Behavior* book is worth 10 points, for a total of 120 points. Each of the 2 assignment on the *General Behaviorology* book is also worth 10 points, for a total of 20 points. And the web–log assignment is worth 10 points. This provides a grand total of 150 possible points. (Except for the assignment on Chapter 5, all assignments are two–chapter or two–part assignments.) The percentage used to consider what grade you are earning is the percentage of these possible points that you actually earn.

However, point accumulation is not the grade determiner but is merely used as a convenient way to track progress *on the presumption that all course tasks are in progress.* This is because doing work on *all* of the tasks for the course is the more relevant determiner of grades than is the accumulation of points. (For example, a student who tries to accumulate just enough points, on some easier tasks, to get a B—while ignoring other course tasks—would not that way actually meet the criteria for a B and so would have to continue and complete all the required work satisfactorily to earn one of the passing grades.)

Also, students should expect to be asked occasionally to complete various test–like assessments. The level of success on these assessments helps gauge the extent to which the work on the course assignments is actually producing the learning implied by the completion of that work.

These practices are in place because the scientific research–data based Shaping Model of Education recognizes the student/professor relationship as a professional relationship in which coercive practices (i.e., aversive educational practices) are seen as inappropriate (so long as extreme conditions do not exist making such practices unavoidable). Instead, the more effective, efficient, and productive non–coercive practices of carefully designed and sequenced assignments emphasizing added reinforcement for timely work well done is generally seen as more appropriate. So, your effort and cooperation are expected and presumed; please do not disappoint either your professor or yourself.

## About Using the Texts & Study Question Books

Unless an assignment specifies otherwise, you need to write out your answers in longhand. The reason you are to write out your answers by hand is that this type of verbal response brings about more learning than merely saying—or even typing—the answer. This is because—as covered in this class—writing the answer in longhand involves both point–to–point correspondence and formal similarity between the stimuli and the response products of the answer.

### The Verbal Behavior Book

The *Verbal Behavior* book covers the principles B.F. Skinner applied, and the concepts he developed, in his original analysis of verbal behavior, including his exploration of exceptions, ambiguities, controversies, applications, and implications. Read the chapters and answer the study questions that cover those chapters. Assignments are provided in the *Assignment Sequence* section.

### The Verbal Behavior Study Questions Book

The study questions were prepared to help you absorb the material from each of the chapters in *Verbal Behavior.* You are to complete each chapter's study questions in the sequence assigned. Learning occurs when responses are made (like writing question answers) and reinforced, especially responses that automatically provide their own reinforcing consequences (like being right) as does writing out study question answers correctly. You complete the assigned study questions, *after reading the chapter through,* by *writing out* the answer to each question when you come to the answer as you *reread* the chapter. You *write out* the answers right in the *Study Question* book. Write out your answers in full sentences that incorporate the questions. Check all your answers. And make any corrections that you find you need to make as you review and learn the material.

The study question book starts with a section titled To the Student and Teacher. *Read this section first!* It explains more on how to do the study questions successfully. (You may also find it helpful to mark the number of each study question in the margins of the text at the location of the study question's answer.) Assignments are provided in the *Assignment Sequence* section. Submit your work according to the method specified in the *Submitting Your Work* section.

*Note #5:* Since you are to write out your answers to the study questions directly in the study question book, you need to have your own study question book. To assure that this is followed by everyone equally, you need to fill out and send in to your professor (by regular postal mail) the original ownership form in the rear of your study question book.

### General Behaviorology: Verbal Behavior (VB) Chapter & Study Guide Materials

The VB chapter of the *General Behaviorology* book, and its study guide materials and questions, are designed to introduce you to a few detailed elaborations of verbal behavior analysis beyond Skinner's original work. Do these two assignment according to the schedule provided in the *Assignment Sequence* section. Submit you work according to the method specified in the *Submitting Your Work* section.

### The Web–log Assignment

This short, written assignment requires you to create a two to three page *typed* log of a one to two hour visit to these three web sites containing verbal behavior material: (a) www.behaviorology.org (the *Contributions to Verbal Behavior Analysis* page), (b) *Journal of the Analysis of Verbal Behavior,* and (c) *Verbal Behavior Special Interest Group* (with links for the latter two being available among the links at www.behaviorology.org). Your log should include not only the times, locations, sequences, and durations of your visit, but also your account of the best things you learned at these sites, plus any interesting discoveries worthy of return visits. You may begin this assignment anytime *after* completing Chapter 14 of *Verbal Behavior.* You should submit this assignment *before* you finish Chapter 19 of *Verbal Behavior* (a period of three weeks). Submit you work according to the method specified in the *Submitting Your Work* section.

### Submitting Your Work

The study question answers and the web log have different work submission methods. These only apply if you are taking the course for TIBI credit. (Any addresses and phone/fax numbers that you may need will be clarified upon enrollment.)

To submit your study question answers, which must be hand–written, you can scan and fax to your professor the pages that have your answers for each assignment. However, your professor would prefer that you photocopy those pages and send them to your professor by regular postal mail.

To submit your web log, you may email your work to your professor (but do not use email attachments). Or, you may scan and fax it to your professor. However, your professor would prefer that you print out your work (although it too may be handwritten), photocopy it, and send it to your professor by regular postal mail.

In all cases, you are to keep the original of your work. This insures against loss and enables you and your professor to communicate about your work (as you will then both have an identical copy). Note, however, that for study question answers, email and email attachments are neither reliable enough, nor identical enough, for this purpose, so they are not to be used for this purpose.

Your work will be perused and points will be allocated according to the quality of your work. Should any inadequacies be apparent, you will be informed so that you can make improvements. While sometimes your professor will provide a metaphorical pat on the back for a job well done, if you do not hear of any inadequacies,

then pat yourself on the back for a job well done even as you continue on to the next assignment.

## Assignment Sequence

Students should work their way through the course by reading and studying the texts and materials, and sending in their work for each assignment. The slowest reasonable self–pacing of the coursework (presuming a typical 15–week semester) is this sequence which can be used as a check off list:

Week 1:  *Verbal Behavior,* **both** Introductions (**and** transfer the corrections into the body of your text) plus the Preface.
Week 2:  *Verbal Behavior,* Chs. 1 & 2.
Week 3:  *Verbal Behavior,* Chs. 3 & 4.
Week 4:  *Verbal Behavior,* Ch. 5.
Week 5:  *Verbal Behavior,* Chs. 6 & 7.
Week 6:  *Verbal Behavior,* Chs. 8 & 9.
Week 7:  *Verbal Behavior,* Chs. 10 & 11.
Week 8:  *Verbal Behavior,* Chs. 12 & 13.
Week 9:  *Verbal Behavior,* Chs. 14 & 15, and begin the Web Log.
Week 10: *Verbal Behavior,* Chs. 16 & 17.
Week 11: *Verbal Behavior,* Chs. 18 & 19, and complete the Web Log.
Week 12: *Verbal Behavior,* Epilogues and Appendix.
Week 13: Parts 1 & 2 of the VB ch. of *Gen. Behaviorology.*
Week 14: Parts 3 & 4 of the VB ch. of *Gen. Behaviorology.*
Week 15: Complete any unfinished work.

Do the assignments in this sequence, even if you do them at a faster pace than the pace presented here. If you go slower than this schedule, assignments could easily back up on you to the point where insufficient time remains to complete them in a satisfactory manner.

*Note #6: Be sure that everything you submit is readable and contains your name!*

*Note #7:* The usual higher education workload expectation for a course is about 150 hours. (The typical face–to–face course features about 50 in–class contact hours with the university expecting about 100 more hours of additional study at the average rate of about two hours out of class for each hour in class.) This can be accomplished at rates ranging from about 50 hours per week over three weeks to about ten hours per week over the typical 15 weeks of a semester. Of course, some students may take a little less than 150 hours, while others may take more than 150 hours, to do the work to the same acceptable and expected standard.

You can—and are encouraged to—go through the assignments as rapidly as your schedule allows. This could mean spending a typical 15 weeks on the course. Or it could mean doing the whole course in as little as—but not in less than—three weeks, as one would progress through the *single* allowed course in a three–week summer school term. That is, you could work on the course anywhere from minimum part–time (i.e., at the rate of about ten hours per week, as described in the *Assignment Sequence* section) to maximum full–time (i.e., at the rate of about 50 hours per week).

If you are to be successful, you need to exercise some self–management skills by starting immediately and keeping up a reasonable and steady pace on the course work. You need to do this because your professor will *not* be reminding you that the products of your work are due; all the course work is set forth in this syllabus and so is automatically assigned. You are expected to follow through on your own. You need to set an appropriate pace for yourself (or accept the pace in the *Assignment Sequence* section) and adhere to that pace, and thereby get the sequence of assignments done and submitted to your professor. This will assist your success.

At various points in the course, you will be provided with feedback about your work. Upon completing all the coursework, you will be provided with your earned grade. (The grade is provided solely for the person whose work earned the grade.) We at TIBI are sure that the outcomes of your efforts to study this aspect of behaviorological science will benefit both you and others, and we encourage you to study further aspects.❧

# *On Verbal Behavior: The First of Four Parts*

## Lawrence E. Fraley

*West Virginia University*

**Editor's note:** Interest in the behaviorological analysis of verbal behavior continues to grow. For example, after this editor presented, in June 2002 at universities in Beijing and Xi'an, China, a lecture that surveyed verbal behavior analysis and applications (Ledoux, Michael, & Miguel, 2002), university administrators there successfully asked administrators at my campus (SUNY–Canton) to arrange for me to teach our verbal behavior–related courses, including our prerequisite "introductory behaviorology" course, regularly and asynchronously to their students. (Those courses are equivalent to these TIBI courses: BEHG 101–Introduction to Behaviorology I, BEHG 355–Verbal Behavior I, and BEHG 475–Verbal Behavior II. The syllabi for these courses [will] appear, respectively, in these issues of *Behaviorology Today:* volume 7, number 2 [two courses], and volume 8, number 1.)

To help support this and all kinds of interest in verbal behavior, *Behaviorology Today* presents the first part in a four–part series on verbal behavior. The remaining three parts will appear in the next three issues. All four parts derive from a chapter of the author's book *General Behaviorology: The Natural Science of Human Behavior.* (See www.behaviorology.org for more detail on this book.)

For each part, the headings hint at the contents:

❧ Some interesting headings in *Part 1* are: Terminological Issues, The Antecedent Control of Verbal Behavior, How Instances of Verbal Behavior are Classified, and The Mand.

❧ In *Part 2* some interesting headings are: Verbal Behavior Under the Control of Verbal Stimuli, The Tact, Abstraction, Private Events, Reality, and Temporal Relations.

❧ Some interesting headings in *Part 3* are: Autoclitic Verbal Behavior, Descriptive Autoclitics, Autoclitics that Function as Mands, Qualifying Autoclitics, Quantifying Autoclitics, Grammar and Syntax as Autoclitic Processes, and The Nature and Occurrence of Composition.

❧ In *Part 4* some interesting headings are: The Private Verbal Behavior of Thinking, The Productivity of Thought, The Utility of Thought, Issues of Privacy and Antiquity, The Absence of Thinking, and Nonverbal Consciousness.

Here is Part 1.—Ed.*

---

*The author's footnotes are at the end of the paper.

# *Part 1*

## Introduction

*V*erbal behavior is a class of operant behavior that is defined in terms of its special conditioning history. B.F. Skinner developed the conceptual scheme of analysis by which we now identify verbal behavior and distinguish among its various subclasses. Skinner's seminal classic, upon which he had worked for a quarter of a century, was published in book form in 1957 under the title *Verbal Behavior.*

### *Definition*

Skinner later commented on the progress in the field of verbal behavior in an article entitled "The Evolution of Verbal Behavior" (1986, *Journal of the Experimental Analysis of Behavior, 45,* 115–122), in which he presented his current definition of verbal behavior: "…behavior that is reinforced through the mediation of other people, but only when the other people are behaving in ways that have been shaped and maintained by a verbal environment or language" (p. 121).

The functions that are involved in the conditioning of verbal behavior are definitive of the general class denoted as social behavior. Just as most lifting behavior (but not all) is exhibited by arms and hands, much verbal behavior is exhibited publicly by the vocally–related musculature. However, in a community of deaf people, the hands exhibit verbal behavior when the community members are signing to one another. Another large subclass of verbal behavior is private and occurs to special parts of the nervous system.

Verbal behavior is defined functionally rather than formally. That is, verbal behavior, as a whole, is defined as such in terms of *how* it is conditioned, shaped, and maintained—that is, by how it is affected postcedently. However, as will be revealed later in this chapter, subclasses of verbal behavior can be distinguished in terms of how instances of each class are subsequently being evoked.

Although verbal behavior often manifests in familiar forms, its form is irrelevant to its qualification as verbal behavior per se. For example, while some verbal behavior manifests vocally, and some manifests as movements of arms, hands, and fingers, other more private varieties are lumped together under the popular general term *thinking*—a kind of behavior that occurs to nerves. Various kinds of such private verbal behavior are respectively implicit in terms such as *being aware, perceiving, visualizing,* and *problem solving*, although not all behavior in these categories is verbal.

### The Conditioning and Control
### of Verbal Functions

While verbal behavior is reinforced only through the mediation of another person, its mere exhibition does not require the participation of such a person. Verbal behavior is commonly evoked in the absence of another listener, but such instances go unreinforced socially. The person who contacts a hat may say, audibly, *That is a stylish hat*, but in the absence of a listener who can provide reinforcers, that statement goes without extrinsic social consequation. However, because a verbal response is heard by its speaker, it may in a sense reinforce itself (a type of automatic reinforcement). The evidence is the repetition, on similar occasions, of that behavior by lone speakers, who, in common parlance cast in agential terms, may be described as persons who like to listen to themselves talk. After all, an intrinsically reinforcing aural stimulus impinging in the form of sound waves is not stripped of its intrinsic reinforcing qualities when it impinges on the ear of the speaker from whom it originated. Speech that fails to reinforce its own production behavior is subject to a kind of intrinsic extinction. It can be sustained only on the basis of reinforcers that are supplied from extrinsic sources, which requires one or more other listeners.

The more effective reinforcement of verbal behavior is supplied by members of a remote audience. Therefore, after repeated reinforcement in the presence, and extinction in the absence, of a listener, a particular verbal behavior will tend to occur only in the presence of a listener. Such a listener must share salient characteristics with the listeners who have played a role in the conditioning history of that behavior. That is why, if previously on city streets one has been successful in asking for directions only from the uniformed police officers among all types who have been asked, one eventually tends not to ask directions of other kinds of people on city streets. However, as the aversiveness called *desperation* intensifies, the asking behavior may come increasingly under stimulus control of the more common features of passersby, and the range of persons to whom inquiries are directed expands accordingly.

Being operant in nature, verbal behavior is evoked by events in the environment. Its rate or its relative frequency is subject to change as a result of its consequating stimuli, which audience members must mediate. That is, verbal behavior, however evoked, may then be reinforced, punished, or extinguished—a characteristic that identifies verbal behavior as operant behavior. Thus, to survive in a person's verbal repertoire, a specific verbal behavior must be selected for that survival by its consequences—meaning, of course, that, if it is to continue reliably to occur on such occasions, it must be reinforced. During the conditioning of a verbal behavior, the consequences are mediated by other members of the individual's verbal community.

### Verbal Communities

A *verbal community* is a set of people who "talk" to each other—that is, who communicate among themselves through language, or more technically, whose linguistic behaviors are maintained by mutual reinforcement. We may speak broadly of the English–speaking verbal community or, more narrowly, of any of its many subcommunities. A verbal subcommunity may consist of the people living in an isolated region whose speech has evolved to manifest a unique dialect. The personal verbal community *of an individual* consists of just those other people with whom that individual interacts linguistically.

An established language (e.g., English, Japanese, Russian, etc.) represents a relatively stable pattern of verbal behavior that is maintained by the special sets of contingencies that are in place within that given verbal community. For example, on the occasion of confronting a drinking vessel appropriate for coffee, a speaker may be reinforced within an Italian verbal community upon an utterance of "tazza," but similar reinforcement of that utterance would not occur in an English verbal community. There, the utterance of "cup" would garner similar reinforcers. "Tazza" and "cup" are merely vocal noises until a verbal community reliably reinforces their production only on specific kinds of occasions. Through that process, the production of those noises becomes verbal behavior, and those sounds become words in their respective languages. Thereafter, in those respective verbal communities, those terms are produced discriminatively in the presence of an appropriate kind of drinking vessel.

When one's behavior is being conditioned, for that behavior to be verbal requires that the consequences not only have to be provided by members of one's verbal community, but those community members have to be providing those consequences in ways that have been shaped and maintained by those persons' own verbal community. For example, when a student is given an unfamiliar object and put under contingencies to call it a *drassit*, the way in which the teacher then consequates the student's doing so must have been shaped and maintained by the teacher's own verbal community.

### Private Verbal Behavior

Perhaps the most challenging aspect of verbal behavior is that, once it has been conditioned, much of it thereafter occurs privately, and only the person in whom it occurs is privy to it. That is because, in addition to audible, visible, or tactile verbal behaviors, which *are* readily detectable by other observers, verbal behavior can also occur in the form of private thoughts and visions, including those that we denote as comprehending, problem

solving, and daydreaming, which normally other people are unable to detect. For such privately occurring verbal behavior, the "speakers" serve as their own listeners.

Verbal behavior in the form of audible speaking involves a coordinated set of muscle–driven motor behaviors. Those vocalizations may be exhibited with decreasing intensity until so little sound is being produced that it cannot be heard. However, even more private forms of verbal behavior are executed entirely by specialized parts of the nervous system—forms of verbal behavior that may involve only molecular scale movements of neural body parts. This class of neural activity occurs among nerve cells. Such events involve the release or transformation of so little energy that they remain undetectable by outside observers unless those observers are specially equipped to conduct sensitive probing for such slight and often well insulated physiological activity. Thus, a person's subvocal statement, *"It is going to rain soon,"* manifesting as a private thought, goes generally undetected in any direct way by other people (although neural physiologists, using special instrumentation, may be able to detect and measure some properties of the involved neural activity).

To the extent that it remains private, no opportunity is created for other members of the verbal community to supply consequences directly to that mini–scaled behavioral manifestation. Two points are relevant: First, the elements of that private subvocal speech were originally conditioned under public circumstances. That is, when the thinker was being conditioned originally to respond in that particular linguistic way to stimuli that typically precede rain, the speech was audible to members of the verbal community. They could then consequate it appropriately and with precision thus conditioning the person to exhibit that verbal behavior in a form that is common to that verbal community. When manifestations of that form of speaking recede to the private subvocal level of mere thought, those thoughts, which are manifesting only as neural activity, reflect the common language of the verbal community. As often noted, people think linguistically only in a language that previously they have learned.

Second, the current private thought may in turn share in evoking some publicly detectable behavior that can be consequated by the social community, such as reaching for an umbrella to be carried along on an outing. If that public gesture is then punished or reinforced by community members, those consequences affect not only the proximal publicly visible gesture but, to a lesser yet often significant extent, the preceding private verbal behavior that shared in evoking that public response. Much private verbal behavior is consequated indirectly in that way.

### Implications for Training

Verbal behavior is both complex and important. As a phenomenal class, verbal behavior commands promi-nence in behaviorological training curricula. Currently, within graduate degree programs in behaviorology, beyond the treatment of verbal behavior in introductory courses, from six to nine additional semester hours of advanced academic credit is deemed necessary.

The behaviorological approach to verbal behavior provides a new and different analytical scheme by which to teach native and foreign languages. The memorization of rules would be largely replaced by descriptions of functions and the pursuit of their implications. The study of grammar would move from surveys of contexts and corresponding forms to surveys of contexts and corresponding effects on audience members—and to feedback loops through which audience reactions would in turn affect the speakers' verbal behaviors. That is, within language training programs, in general, importance would tend to shift from form to function, a more powerful analytical approach to linguistics that is made possible by the emergence of the necessary basic science.

## Terminological Issues

Traditional terms that are adopted from common language have the advantage of being readily comprehensible, but peoples' responses to a traditional term tend to differ, and terms that are adopted from common language will often imply more than is appropriate in the technical contexts to which those terms should pertain. Furthermore, those extra implications are often precisely the implications that an appropriate technical term should exclude. That dilemma has often resulted in authors of scientific manuscripts coining new terms that they can then define with the necessary precision.

That is especially true of the new and different behaviorological analysis of verbal behavior—a familiar phenomenal class that since antiquity has been addressed from the fuzzy perspectives of common lore. B.F. Skinner found it necessary to coin several new terms when writing *Verbal Behavior,* as have various other behavior scientists when tinkering with Skinner's analysis or extending it.

Let us consider a typical kind of example, pertinent to the analysis of a verbal episode, that often arises in the teaching context: From the behaviorological perspective, a speaker, in response to certain antecedent stimuli, exhibits a verbal utterance. A listener then responds in some way that provides consequences of that utterance. That consequation, which the speaker contacts as a result of the listener's response, alters the controlling function between the speaker's verbal behavior and the antecedent stimuli that originally evoked it—a change that tends to be revealed on future occasions of the speaker's encounter with those stimuli. These events collectively exemplify the familiar operant conditioning process. Most students

in behaviorology courses, who must master these functional intricacies, have no difficulty with the common terms *speaker* and *listener* when following descriptions of these functional events and sorting out the roles respectively played by the two involved parties.

However, throughout the last part of the twentieth century most behaviorology courses had to be taught in psychology departments to superstitious students who were long committed to the assumption that bodies behaved in response to the will of implicit spirits called *selves* in secular contexts and *souls* in more spiritual contexts. According to the prevailing secularized presumption, the selves, in some proactive way, initiatively cranked the physiologically based "mental cogs" to produce decisions that, through the will of that self–agent, were compelled to manifest behaviorally. Behaviorological instructors, in attempting to supplant such mysticism with concepts of scientific naturalism, were often frustrated by the intransigence of those resident spirits, especially when they were cast in their religiously inspired *soul* personas.

Upon encountering the term *speaker*, typically, the mystical student at once assumed the presence of an internal but often incorporeal mental agent that initiatively generated whatever vocal behavior was exhibited. From that mystical perspective, the speaker was more than the body that spoke; the *speaker* was the mysterious agent within who made decisions about what that body would say. In a similar way, the term *listener* was often interpreted as an internal agent that, in a more or less autonomous way, considered a speaker's statement and initiatively decided upon an appropriate reaction, the behavioral orders for which were then communicated to the movable body parts for behavioral execution. Not surprisingly, teachers of the natural science alternatives to such common superstitious indulgences tended to prefer new technical terms that would not as readily evoke such superstitious miscarries.

Professor Ernest Vargas, who in the late 1900s taught courses in verbal behavior at West Virginia University, adopted the terms *verbalizer* and *mediator* in place of *speaker* and *listener*. The verbalizer is simply the body that exhibits the verbal behavior that is under consideration, and the mediator is the body that behaves in response to the verbalizer's statement and does so in ways that consequate the verbalizer's statement. Importantly, by definition, neither of them is anything more.

While a number of advantages are gained by adopting these terms, doing so seldom insures that the analytical thought of superstitious students will indefinitely retain the naturalistic perspective. Technical terms can help maintain a naturalistic focus on the subject matter, and that is why they are coined and employed. However, expectations that precisely defined technical terms will keep a student separated from the implications of that

student's own mystical basic assumptions imply a challenge that exceeds the capacity of mere terms.

Such a superstitious student already knows, with a certainty born of faith, that a verbalizer would have to be the same mental agent that a speaker is understood to be. The instructor who insists that a verbalizer is only a body that exhibits verbal behavior is making that pitch to a student who knows, with comfortable certainty, more about it than that instructor is prepared to concede. As far as that student is concerned, that instructor is constrained by some narrowing rules of scientific logic from moving conceptually into a wonderful and awesome domain where that unfettered student is free to roam.

While a natural scientist may view that student's mystical thinking as forays into a fool's paradise along paths of self deception, the fundamentally superstitious student has a different view. Such students interpret their own frequent reversions to superstitious interpretations as their way of keeping a finger on the pulse of reality during their temporary detours into the sadly limited world of natural science, which they are undertaking to gain insights into the often appalling limitations with which natural scientists burden themselves in order to do their necessary if somewhat dehumanizing kind of work.

While superstitiously indoctrinated students theoretically can be purged of their superstitious behavior, the necessary programs of reconditioning are typically so intense and so time consuming that the arrangements for them are more characteristic of protracted therapy than of academic instructional programs. As a matter of economy, science instruction, if it is to be effective and efficient within the constraints imposed by traditional instructional operations, must be directed to students who have been kept relatively free of superstitious indoctrination. However, the selection of superstition–free students for programs designed to produce effective scientists is difficult within a superstitious culture.

With students who are receptive to science, the introduction of new technical terms can sometimes prove effective. For instance, the term *verbalizer* in place of *speaker* better incorporates the non–vocal yet public forms of verbal behavior, such as the manipulative behaviors of a person who is exhibiting sign language. The term *mediator* in place of *listener* better suggests the important functional role played by that party in the conditioning of a verbal operant. That is, *mediator* stresses that party's contingent provision of the behavior–changing consequences of the *verbalizer's* verbal behavior. Insofar as the consequences of the *verbalizer's* verbal behavior are mediated by the *mediator*, those terms closely fit the functional reality of a verbal episode. Nevertheless, the terms *speaker* and *listener* continue to appear frequently in the scientific literature of verbal behavior, and readers should

remain prepared to interpret them interchangeably with *verbalizer* and *mediator* in most contexts.

## The Antecedent Control of Verbal Behavior

Verbal behavior, being operant, is evoked by stimuli in the environment of the behaving organism. Consider two aspects of an instance of operant conditioning: (a) the momentary structure of the body that is being conditioned—a structure that, at any given moment, is determined by the prior operant conditioning of that body along with a variety of other physiological factors, and (b) the structure of the environment of that body, structured as it is at that same moment. Whatever verbal behavior then occurs to that body is simply the natural and inevitable reaction of that bodily structure to that environmental structure as energy from the latter impinges on the former.

Failure to predict accurately an impending behavior is not evidence that nature is capricious, but rather that the sets of variables that respectively define the body and its environment at that moment have not been subject to a full accounting. Failure to render accurate predictions measures the ineffectiveness of the behavior of the person who predicts, not lapses in the functional aspect of nature.

Given an instance of verbal behavior, we can always ask meaningfully what controlled it. The question pertains to its antecedent (i.e., evocative) environmental stimuli. If our inquiry is informed by a philosophy of naturalism, we anticipate that a valid and reliable answer is possible in terms of measurable variables, and we tend to look for those behavior–controlling antecedent stimuli. In the past, under similar search conditions, we have so often discovered functional antecedent controls in proportion to the effort expended to discover them that our behavior to reveal such environmental evocatives for a specified behavior now tends to continue unabated (or, as it may be stated in terms of popular fictional constructs, our current expectation that precise controls exist to be discovered is much strengthened).

Here we describe a philosophical contribution to scientific activity (i.e., the proposition that measurable functional antecedents of a detectable event always exist to be identified). In this case the relevant philosophy informs a typical kind of analytical activity in the field of verbal behavior—namely, the search for functional antecedent variables. That scientific activity has potentially important technological implications pertinent to verbal behavior: Once those antecedent controls on some verbal behavior are identified and their functions have been delineated precisely, we can then manipulate those antecedent variables to gain control of the kind of verbal behavior that is dependent upon them.

In the context of this discussion, the important relation is between (a) the nature of the prevailing philosophy and (b) the ultimate realization of the useful technological capacities (i.e., the capacity to *control* the kind of verbal behavior in question). In general, the basic assumptions with which one begins one's efforts to cope will indirectly determine the ultimate quality of life that is realized as a benefit of the scientific activity that those assumptions have informed. Better philosophy informs more effective science, which, in turn, yields more effective technology (i.e., environment–controlling arrangements). Those qualitative implications that inhere in these general relations remain valid when verbal behavior happens to be the kind of environmental event upon which the science is focused.

When we are under general contingencies to account for a statement in its totality, we may inquire about the nature of the controls on that particular sample of verbal behavior, as when we ask why a given person would have just said that *"a car will soon arrive at that intersection."* Was that statement controlled by a visual contact with an approaching car? Has the person perhaps only heard the sound of a distant car? Was it merely a probability statement based on the distribution pattern of passing cars during a preceding interval?

We may also ask such questions about the *elements* of the statement: Why did the person say *"a car,"* and why a *car* instead of another kind of vehicle? Why was the word *soon* included? Why say *that* intersection instead of *this* intersection, or *the* intersection? Not only does the statement in general have its environmental controls, each formal linguistic nuance of its structure also results from controlling factors that can be identified.

An old piece of wisdom asserts that there is a reason for everything, and that is certainly true when applied to verbal behavior and its elements. An important implication is that grammar or syntax should be taught in terms of the functional controls on linguistic forms rather than in terms of rules that prescriptively describe but cannot account for acceptable forms.

## How Instances of Verbal Behavior are Classified

Verbal behavior in general is defined functionally, and so are the various subclasses of verbal behavior. We distinguish among various subclasses of verbal behavior on the basis of the kinds of contingencies in which those verbal behaviors occur. In preparing to classify an instance of verbal behavior, we typically ask *why* it has occurred—that is, we attempt to identify the stimuli that have evoked it. To classify a verbal response, we may also look at how the response was consequated. For all subclasses of verbal behav-

ior, the survival of an evoked form of the behavior depends on the subsequent reliability of its reinforcement.

Recognized classes of verbal behavior include mands, tacts, and autoclitics as well as verbal behavior that is evoked by verbal stimuli. Within each such larger class, various subclasses may exist. In the following subsections of this introductory chapter we will review some of the major classes of verbal behavior and the respective kinds of controlling functions by which they occur.

## The Mand

Within a given verbal community, certain verbal operants, such as *Help!, Duck!,* or *Scalpel!* are characteristically followed by certain consequences. *Help!* is followed by assistance behaviors on the part of others who are close enough to hear it. *Duck!* is followed by behaviors that lower the height of the mediator's body. *Scalpel!* is typically followed by an attendant passing a scalpel to the speaker.

We note that such outcomes are usually reinforcing to the vocalizer, and that the main reinforcement is the negative kind. That is, those utterances tend to occur under an aversive state that is alleviated by the consequence that is implicit in the mediator's response. The aversiveness may be of any kind, including the kind called *deprivation* or the kind called *threat*. For instance, a surgeon, with no scalpel in hand, who comes under contingencies to make a cut, is thereby put in a state of deprivation with respect to a cutting instrument. A scalpel can then be made to manifest in the surgeon's extended hand if the surgeon says *Scalpel!* Its appearance in the surgeon's hand relieves the deprivation thus completing the episode of negative reinforcement.

While the surgeon experiences private aversive stimulation prior to contact with the scalpel and thus may be satisfied with an account that features the termination of such privately appreciated aversion, we can trace the chain of events backward in time to get outside of the surgeon's body where the relevant stimuli are publicly evident. For example, we can regard the uncut patch of flesh as an "aversive stimulus" for the surgeon, and regard the same patch of flesh with a cut in it as a non–aversive stimulus. We then note that the surgeon's cutting behavior changes the publicly evident aversive stimulus into a publicly evident non–aversive stimulus. Thus, a trace of functionally related events from the private internal domain to the publicly detectable external domain retains the important quality of functionality while making possible an account in terms of variables to which all parties have access.

Emotionally, the surgeon may have felt relieved when the transition from aversive to non–aversive stimulus occurred, but those attendant feelings are not essential to our classifying the process as negative reinforcement. The nega-

tively reinforced behaviors were (a) the extension of the hand, and (b) the verbal mand (i.e., *Scalpel!*). The function–altering stimuli (a.k.a. establishing operations) were the presence of a scalpel that could be passed and a nurse who was available to do that. Note again that this externalized account features only stimuli that are publicly evident and can thus be satisfying to observers who cannot be privy to private events that may occur within the surgeon.

Any consequence of the surgeon's mand may have an operant conditioning effect on that vocalizer. If the mand *Scalpel!* reliably results in the surgeon's contact with a scalpel, with each such reinforcement, the utterance of that sound is incrementally put under stimulus control of the environmental circumstances that prevailed when it was uttered. With each reinforced instance of the utterance, those environmental circumstances may be said to gain an increment of capacity to evoke that utterance, although the changes that occur during such operant conditioning take place within the body of the vocalizer. With each reiteration, those particular environmental circumstances (in this example, the presence of something that would be reinforcing to cut) become more likely to evoke the utterance of *Scalpel!* As that kind of operant conditioning approaches sufficiency, an observer would note that the absence of a scalpel in a kind of situation in which cuts have previously solved a problem is reliably followed by a particular mand (*Scalpel!*) that, in turn, is reliably followed by audience behavior that affords relief in the form of a passed scalpel.

---

A mand is a verbal operant in which the response is reinforced by a characteristic consequence and is therefore under the functional control of relevant conditions of deprivation or aversive stimulation. (B. F. Skinner, *Verbal Behavior,* pp. 35–36.)

---

Such an utterance is called a *mand* (plural, *mands;* infinitive, *to mand;* gerund, *manding;* agent, *mander)*. The term *mand* was coined for its mnemonic advantage based on peoples' familiarity with terms like *demand* and *command*. A mand may take the form of a single term (e.g., *Move!*)–sometimes called a raw mand, or a mand may be expressed in a more complete sentence (e.g., *Please move all the way to the back of the bus*).

Note that terms such as *deprivation* and *aversive stimulation* allude to private events in the class commonly called *feelings*, the inaccessibility of which poses problems for external analysts of behavior. We have reviewed how such problems of access can be circumvented by relating the mand to the externally evident operations that were functionally responsible for those internal states. For instance, we cannot be sure that the person who requests a drink of water is responding to the aversive private

stimuli that arise within the body from water deprivation, because we cannot share that person's private feelings. However, we can observe the publicly evident activities of that person. We can also count instances of water consumption by that person and measure the quantity of water consumed. On the basis of such records in general, we may assert that bouts of hard work in conditions of excessive heat tend to evoke mands for potable water, and in such particular cases we may then treat the occurrence of the person's mand for water as a function of having worked hard in excessive heat.[1]

Likewise, a scream for pain–relieving medication, which is a mand evoked by private stimulation of the kind called pain, may be linked functionally to a publicly evident behavioral operation such as sticking a finger into a bed of hot coals. That mand may then be said to be evoked by the publicly detectable behavioral operation of poking a finger into the hot coals. Analytically, beginning with the putative private event to which we have no convenient access, we merely work backward in time along a chain of hypothetical functionally related events until we reach the external domain in which we can confirm events in general. If there, in the external domain, we have noted the person's finger going into hot coals, we can describe the evocation of the mand for medication in terms of that finger poke (which we have observed) rather than in terms of some private pain that we cannot detect. The reliability in the temporal relation of fingers in hot coals and mands for relief is the basis of our assertion of a functional relation between them.

Obviously, a mand works to the benefit of the vocalizer. The mand specifies either (a) its own reinforcer, (b) the action of the mediator that will provide such a reinforcer, or (c) both. When a thirsty person vocally begs *Water!*, that utterance is presumably evoked directly by the aversive stimulation that accompanies water deprivation, while at the same time the utterance per se specifies the particular negative reinforcer that will reduce the verbalizer's state of deprivation (viz., water). If the mand occurs in the expanded form *Hand that glass of water to me,* it also specifies an *action* by the mediator that will result in the vocalizer contacting the specified negative reinforcer.

On the other hand, suppose that a person perceives something in the environment that threatens a companion, and that threat to the person's companion is aversive to that observer. If that aversiveness can be reduced by the companion running away, the observer may then shout "Run!" to that companion. Note, in this case, that the vocalizer is specifying a behavior that, if executed by the companion, will negatively reinforce the vocalizer by reducing a threat to the companion that to the vocalizer functions as aversive stimulation. The negatively reinforcing stimulus is the companion's proximal relation to the threatening event (in this case, the verbalizer's mand did not specify that aversive stimulus). Instead, the mand merely prescribed a behavior for the companion, the execution of which would reduce the aversiveness of the negative reinforcer for the vocalizer. That is, the farther from the threatening event the companion gets, the more the vocalizer is relieved. A common class of examples feature parents' manding their children to escape from potential danger (e.g., *Get away from that lawnmower blade!*).

If a vocalizer says *"Give your money to me,"* the vocalizer is both specifying the ultimate reinforcer of that mand (*money*) and the behavior to be executed by the mediator (*give… to me*) that will bring the vocalizer and the specified reinforcer together. Note that, in this case, the vocalizer's receipt of the money is likely to reinforce in both a negative and a positive way. The impecuniosity of the vocalizer may be a conditioned aversive state and, if so, the vocalizer's statement simply mands the mediator to behave in a way that will afford negatively reinforcing relief. At the same time, to the extent that money is, in general, an effective conditioned positive reinforcer for any behavior by the vocalizer, the vocalizer's statement is also positively reinforced when it results in the vocalizer's contact with money.

Other people' doing what one tells them to do can become a generalized positive reinforcer for the verbalizer. While compliance with the mands of such people provides them with negatively reinforcing relief from aversive stimulation, that compliance can also be positively reinforcing if those verbalizers have been conditioned such that their manding per se is positively reinforced by the compliance of others with their mands. In those rather familiar cases, such obedience on the part of others has become an abstracted (i.e., generalized) positive reinforcer per se. It may be said of such manders in everyday language that "they take pleasure in the fact that others tend to comply with their requests."

To complete the account of an episode of manding, we must extend our analysis to the person or persons to whom the mand is directed—that is, to the vocalizer's audience. At issue is why a member of that audience would behave precisely in a way that reinforces the mand of the vocalizer?

People are generally conditioned to behave in ways that reduce what to them is aversive stimulation. A typically conditioned individual will probably retreat from a source of excessive heat, scratch an aversive itch, or request that an obnoxious visitor leave the premises. Whatever punishment the current conditions are inflicting on a person, that aversiveness may continue unless that person behaves so as to bring it to an end. That is, absent a retreat from the hot spot, the person continues to get burned; absent the scratching, the itch persists; and absent the issuance of an effective departure order, contact with the obnoxious guest will continue.

Note that, in the latter case, the escape is effected via a mand, whereas in the first two cases, verbal behavior

plays no role in effecting the specified escapes. In those cases of escape, other forms of escape were possible, and they may have involved mands. For example, the person who suffers an itch could ask another person to scratch that itch, and one who is being burned by a fire could ask another person to dowse the flames. Within a verbal community, for many kinds of aversive relations, manding may represent a worthwhile means of escape.

If a mand is not followed by audience behavior that provides access to the specified or implicit reinforcer, the alternative behaviors of members of the audience are generally punished by the vocalizer. The aversive stimulation inherent in that punishment procedure can then be ended by the audience member's finally complying with the vocalizer's mand. That is, the aversive stimulation that is inflicted by the vocalizer when the behavior of the mediator is not compliant can be withheld by the vocalizer whenever the mediator begins to comply with the mand.

In general, the members of a verbal community thus become conditioned to treat *any* mand as implicitly threatening, even before any punishment for noncompliance is initiated. Audience behavior that complies with a vocalizer's mand is thus negatively reinforced in the sense that the compliance removes that threat, whether it has been made explicit or is only implicit in the manding form of the vocalizer's statement. It is generally deemed imprudent always to delay one's compliance with mands until a vocalizer actually inflicts punishment, although children will typically probe those limits as a somewhat natural aspect of the socialization process.

As an aspect of conditioning peoples' general compliance with mands, mands are followed reliably with punishment of the alternative behavior as long as compliant behavior is not being exhibited. During this conditioning, mands are thus paired with the punishment that ensues until compliance behavior occurs. Through that kind of pairing, mands themselves will begin to take on an aversive capacity through a generalization process. That is, all mands are initially unsatisfied and remain so until the mediator exhibits compliance behavior—an interval during which the mediator's interim behavior is subject to punishment, because it is noncompliant. An unfulfilled mand thus comes to define the kind of aversive state that we call *threat*. Through such a general conditioning procedure, the members of a verbal community are conditioned to behave in ways that bring verbalizers into contact with whatever they mand.

In some cases, the vocalizer is incapable of punishing the noncompliant behavior of a person to whom a mand has been directed. The mander may instead withdraw from the presence of that person thus precluding any further occasions to mand that individual's behavior and suffer subsequent instances of noncompliance. If the presence of the mander is reinforcing to that individual for other

reasons, the departure of the mander can function as negative punishment of that individual's noncompliance with the person's mands. The mander may describe such episodes in common agential terms: "When individuals are inappropriately unresponsive to certain of my needs, I opt to deprive them of my further company."

Compliance with mands is further strengthened when, throughout the community, compliance, in general, is regarded as the socially polite way to behave, especially if compliance is relatively harmless to the mediator. Compliance with mands, if deemed proper in general, is thus divorced from concern about the specific action that is manded. Mands per se are to be obeyed as the proper thing to do regardless of what behavior is required for the compliance. Through this social device, the attention of the entire community is brought to bear simply on the matter of the compliance per se. To the extent that the entire community thus takes a hand in the conditioning of the general politeness of each citizen, compliance behavior with respect to mands, in general, can then be reinforced positively by members of the community at large without particular regard for the mander's problem or the specific compliance behavior that follows the mand. The abstract advice often given to children, "do whatever you're told to do," is treated as valid in general without reference to the particular behavior that would be required to do that in any given instance. Conversely, the punishment of noncompliant behavior becomes a similar community obligation. Such an extension (of the conditioning program for mediators) to the community level is of help to manders who lack the capacity to inflict effective punishment on occasions of noncompliance.

The community enforcement of such general politeness is limited to compliance behaviors that portend no adverse implications for others (e.g., passing an out–of–reach tool to a coworker who has asked for that tool). Compliance behaviors that, directly or indirectly, would probably damage the integrity of the community are not deemed polite and are excluded from such general community sanctions. For instance, robbery victims who resist surrendering their money are not subject to aversive treatment by the general public for a failure to yield politely to the demands of such criminals.

Advanced social training provides analytical practices by which the motives of the mander (i.e., the contingencies under which the mand occurs) as well as the implications of potential compliance behavior are taken into account in ways that may cancel the effect of a mand. The person who is manded to walk out onto thin ice that covers a deep lake probably should not exhibit compliance behavior. If the potential mediator does not provide that manded reinforcer, the mediator may be said to be demonstrating good *judgment*. However, the walk on thin ice is not being restrained by some fictional causal trait called judgment

a supply of which is putatively possessed by the hesitant mediator. Instead, certain verbal practices of the mediator that are evoked by certain features of the unfolding episode result in the establishment of contingencies that counter–control those being arranged by the mander.

Note that the cultural conventions of politeness, although often touted as being endowed with intrinsic virtue, actually have functional origins that are subject to analysis. As some have astutely observed, "people are polite for a reason," or "it pays to be polite." One aspect of politeness, compliance with mands, originates in specific instances of negative reinforcement insofar as such behavior reduces threats or terminates actual on–going punishment. On the other hand, polite patterns of behavior, having come to be regarded as "good" in an abstract way, are generally subject to positive reinforcement. Polite behavior is said, in that sense, to garner respect. Thus, when Lido opens the door for a delivery person who arrives carrying a heavy box, Lido avoids the potential wrath of the delivery person who would have had to drop the box to open the door, and Lido may also contact some positive reinforcers of that behavior, because it falls in the class called politeness. Polite behavior, in general, contributes to the benefit of all members of the social community who therefore stand ready to reinforce any polite behavior, including the kinds that comply with mands.

The general kind of conditioning for compliance with mands is typically conducted using mild rather than severe stimulation. For example, a parent who is teaching a child to maintain an orderly play area, may tell the child to "put away those toy building blocks that are scattered on the rug." If the child does not quickly exhibit the pick–up–and–put–away behaviors, the parent may simply pause and look blankly in the child's direction. That parental gesture can function as a mild punisher if previously the child has been conditioned to find aversive any such small sign of parental displeasure. In an adult version, a carpenter may say to a helper, *"give me that hammer,"* while looking intently at the helper and holding out a hand to receive the hammer. A properly conditioned helper would experience increasingly aversive stimulation from the continuation of any personal behavior that does not involve passing that hammer. In the externalized version, we could say instead that the carpenter's extended and empty hand becomes increasingly aversive to the helper as long it remains separated from that hammer.

In such cases, the punitive nature of both (a) the mand per se and (b) a normally brief sequence of events prior to the mediator's compliance are so mild that neither party takes special notice of it nor attaches social significance to it. The controls on behavior within a social episode that begins with a mand can, indeed, often manifest with low intensity; they need only be sufficient to establish functionality. Our compliance with many of the

mands that we encounter during normal social intercourse feature aversive stimulation that, although functional as such in the on–going verbal episode, remains below the threshold for evoking the kind of behavior that we describe as taking notice of its aversive nature. Typically, the mediator is only mildly threatened by the mand. Although the contingency may be quite weak, the well socialized mediator complies under what is technically a contingency of aversive control (i.e., negative reinforcement). Such a typical episode passes as a normal and insignificant social interaction.

Weak but adequate aversive control can also be found in common nonverbal examples. Recall that, when walking, something as routine as the extension of a leg, which initiates the next step, occurs primarily under what is normally mild aversive control. Whether the behavior is verbal or nonverbal, it is the *severity* of the aversive control that evokes our unfavorable attention, not the mere fact that the controls are of the aversive kind.

When a mediator has complied with a vocalizer's mand, the vocalizer may utter a concluding response such as the typical *"Thank you."* That utterance, which is said to represent *polite* social behavior, functions to make more clear that the threat implicit in the preceding mand has been lifted. The "thank *you*" also provides a mild positive reinforcer of the mediator's behavior of compliance, which supplements its negatively reinforcing effect. Thus, for those two kinds of reasons, such compliance behavior is rendered even more probable on future occasions.

The implicit threat to the mediator in a single mand may be ended most expeditiously by compliance behavior. However, frequent manding by a vocalizer, especially with mands that imply stronger threats, tends to increase both the rate and severity of such aversive contacts. That aversive pattern may be avoided either by the mediator's permanent escape from the mander, which precludes the aversive threats in the mands, or by a more aggressive kind of revolt that reduces the frequency of the manding. Examples of the former feature the child running away from home or the carpenter's helper quitting his job. Examples of revolt by a mediator include the excessively manded child setting the house on fire, the pressured helper throwing the hammer at the carpenter. An overly pestered listener may also simply reply with hostile rhetoric (e.g., *Shut up, you pompous, demanding, loud–mouth!*).

Such revolts, to the extent that they pose real counter–controlling threats to the mander, condition manders to temper in various ways the inherent implicit threats of their own mands. Thus, the threat in a mand may be disguised. For instance, note how the form *"Would you pass that ruler to me?"* makes the mand seem more like a neutral question, as if to imply that the mediator is free to do something else but would earn the appreciation of the vocalizer were that mediator to com-

ply. *"Please pass that hammer to me"* implies a diminished threat for noncompliance and emphasizes that the mediator's compliance may even earn some unspecified form of reinforcing gratitude from the vocalizer. Mands may also be made to seem less threatening by loading them with some reinforcing praise: *"Pick up your toys, sweetie"* or *"Pass the salt and pepper, my dear lady."*

If a mand prescribes behavior that is implicitly positively reinforcing to the mediator as well as negatively reinforcing to the vocalizer, the compliance behavior, in general, becomes more likely to occur. Such a mand is likely to be described by the mediator as *good advice.* For example, the mander may say *"Look on the backsides of those can labels to see if you are a contest winner."* If the mediator does so and finds a reinforcing notice of a win on one of the labels, that mediator will be more likely to comply with that vocalizer's similar mands on future occasions. In this example, the well–being of the mediator may be reinforcing to the verbalizer, and the mediator's neglect of a potential contest win is therefore aversive to the verbalizer. That aversiveness is relieved when the mediator examines the backs of the can labels. The unfulfilled mand is also aversive to the mediator, who gains relief upon complying with the mand. However, if the manded behavior has led to positive reinforcers of the mediator's response, the *future* frequency of the mediator's compliance with similar mands will be a function of the history of both the negative and positive reinforcement.

Mands function to control the behavior of the mediator, and traditional descriptions and interpretations of manding episodes are cast in terms of the *intentions* of the vocalizer. However, in a behaviorological consideration, intentions are fictional constructs. From the invalid traditional perspective, a typical analytical question is "What does the vocalizer want the mediator to do?" However, in a natural accounting there is no agent within the vocalizer to operate on the basis of fictitious constructs called *intentions* or *wants.*

In a natural science of behavior, the concept of intention is replaced by the concept of the prevailing contingencies that are controlling the behavior of the body in question. We ask instead, "Under what contingencies is the vocalizer exhibiting a mand?" In that way the focus is kept on the behavior–controlling environment instead of being sidetracked on a futile search for a fictitious internal behavior–compelling source called an *intention.* A body is merely behaving verbally in functional response to certain aspects of its environment, and behavior that is exhibited in the form of a mand is not really the work of a body–driving self–spirit that is motivated by *intentions.*

The broad field of *motivation* is concerned with the nature of the controls on behavior and how best to manipulate those controls. Traditionally, the featured approach has centered on the construct of *mind* and how to

"change it," because, in the traditional view, behavior has been construed as a subsequent implication of the cognitive and emotional activity of a proactive and always at least somewhat mysterious mind. Internal constructs such as *wants*, *needs*, *desires*, and *wishes,* cast as various kinds of mental activities, have been invented or conjured as required to provide the presumed internal origins of behaviors that, in fact, do not originate through internal spontaneity. Analytical progress is improved when the analysis of motivation turns more productively to behavior–environment functional relations. The functional analysis of the mand then becomes one aspect of a broader and more valid kind of analysis of motivation.

The behavior of manding tends to be strongly conditioned because it so often proves to be effective. However, a given mand may be futile for two general kinds of reasons. First, there may be no person present who can mediate the reinforcing consequences. For instance, when a person who is stranded alone on an island shouts *"Just give me a boat!,"* the mand fails for lack of another person whose compliance behavior may produce a boat. Even if a listener is present, that listener may be without the means to function as a mediator for such a mand.[2] The second reason that a mand could be futile is that the listeners who are present may represent classes of people who have *never* provided the specified consequences. Thus, they may lack the kinds of behavioral conditioning that would be necessary for them to do so. It is commonly said that such a person does not know how to comply. Mands that are futile for either kind of reason are called *magical mands.*

Consider first the former class of magical mands: If, in the past, a particular kind of mand has been successful in certain kinds of situations, a similar situation may evoke that form of mand even in the absence of a listener. The evocative situational stimuli are so strong that they force the mand even in the absence of a listener who could hear it and consequate it. The vocalizer merely describes the reinforcement that is appropriate for alleviating the vocalizer's current state of deprivation, as when a person, who is alone and freezing for lack of a fire, exclaims "I need some matches!" Given a sufficiently severe state of deprivation, the relative contribution of a mediator to the evocative function is diminished until the circumstances that define the aversive deprivation are alone sufficient to evoke the mand, futile though it may be. We could say that as the aversiveness increases a potential listener loses the capacity to serve as a function–altering stimulus, and the utterance is exhibited in both the presence *and* the absence of a mediator.

In the second class of magical mands, listeners may be present, but listeners of that kind have *never* provided the specified reinforcers. A wounded person may scream *Get the bullet out!* when the only potential mediator is clearly an individual with no medical experience who

lacks the skill to remove a deeply embedded bullet. If that incapable listener shares obvious properties with others who do have the skill to comply with that mand, the mander may later explain the futile mand by insisting that *"the person looked like he* (or *she) could help."*

A *wish* is classified as a magical mand if the specified consequence has *never* been produced as a functional result of such verbal behavior (e.g., *I wish that this mud would change into ice cream)*. Another common example of a magical mand is *I wish that I could sprout wings and fly*. The statement *I wish that she would lose her wealth* is a magical mand if such statements by that verbalizer have never resulted in that kind of financial loss.

If, however, the same statement is uttered by a powerful leader who knows that certain loyal followers will reliably contrive to fulfill that leader's uttered wishes, the mand is only disguised linguistically to sound magical. Functionally, such a mand is a practical and effective statement, because others insure that the leader's wishes come true. Thus, it is not necessarily the form of the statements, but their functional futility, that shifts some mands into the magical class.

[Part 2 continues in the next issue.—Ed.]♣

## Footnotes

1　(p. 16) Note that functions are asserted on the basis of events from one class reliably following events from another class. We do not observe a *function*. We see only the sequential manifestation of events. If one kind of event is reliably followed by another kind of event, an observer reacts to such repetitions with a decrease in behaviors that comport with coincidence and an increase in behaviors that comport with function—including the eventual assertion of a functional relation between those kinds of events. We say that the repetitions of the sequence are *observed*, while the functional relation between its elemental events is *inferred*.

2　Note that *listener* and *mediator* are not always synonymous. In this sentence (p. 19) they are not interchangeable.

## References

Ledoux, S.F., Michael, J., & Miguel, C. (2002). *An Introduction to the Elementary Verbal Operant Relations in the Verbal Behavior Analysis Component of Behaviorology Plus Some Initial Implications and Applications for Foreign Language Teaching*. Canton, NY: Stephen F. Ledoux. [Contact TIBI for options on obtaining this booklet. For more verbal behavior resources, see the "Contributions to Verbal Behavior Analysis" page on the *Complete Behaviorology Community Resources* page at TIBI's www.behaviorology.org web site.]

Skinner, B.F. (1957). *Verbal Behavior*. New York: Appleton–Century–Crofts. Reprinted, 1992, Cambridge, MA: The B.F. Skinner Foundation.℮℈

# *TIBI Online Syllabus for BEHG 420: Performance Management and Preventing Workplace Violence*

## Stephen F. Ledoux

*SUNY–Canton*

[This is another installment in the series of syllabi for TIBI's online courses. Each syllabus appears in *Behaviorology Today* basically in the same form as it appears online. The series continues whenever there are syllabi that have yet to be printed, or that require reprinting due to substantial revisions. Locate additional syllabi through the *Syllabus Directory* at the back of this issue.—Ed.]

*N*ote #1: This syllabus contains some notes that supplement the more traditional syllabus parts. Each note is numbered for convenient reference. Some notes, like this one, have multiple paragraphs.

*This syllabus is a long document*. It is longer than a syllabus for a face–to–face course as it contains material that the professor would otherwise cover in person. *Hence it was designed to be printed out for reading!* Furthermore, it was designed to be used *as a task check–off list*. Please print it out and use it these ways.

Indeed, aside from a simple web–log assignment, the only activity in this course for which you need access to a computer *is* to print out this syllabus and use it to see what this course covers and how it works, and to follow the directions to complete this course. This is a matter of access, student access to education, so that everyone who wants this course can take it regardless of whether they own several computers or only have access to one in their local library or in a friend's home.

Students can, if they wish, study the topics of this course free of charge, perhaps to fulfill their own inter-

ests. They would do so simply by completing the activities described in this syllabus.

Students can also study the topics of this course for TIBI (The International Behaviorology Institute) credit, perhaps toward a TIBI certificate. They would do so by paying the necessary fee to be assigned a professor to provide feedback on, and assessment of, their efforts. This course can be part of several TIBI certificates; contact TIBI or visit www.behaviorology.org for details.

Also, students can study the topics of this course for regular academic credit; they would do so by contacting any accredited institution of higher education that offers behaviorology courses accepted by TIBI, such as the State University of New York at Canton (SUNY–Canton) at www.canton.edu which is SUNY–Canton's web site. At SUNY–Canton this course is offered as *SSCI 455: Performance Management and Preventing Workplace Violence.* TIBI automatically accepts A or B grades from the academic–credit version of this course as equivalent to its own course toward its certificates (and C and D academic–credit grades can be remediated through TIBI for TIBI credit; contact TIBI for details). Alternatively, the work done completing this course through TIBI may make taking the course for academic credit easier; ask the professor who teaches SUNY–Canton's equivalent course about this.

The parts of this syllabus cover many topics. While the headings may be different, these include (a) the course content and objectives, (b) the text, study, and assessment materials, (c) the grading policy, (d) the necessary work–submission methods and professor feedback, and (e) the study–activity sequence and completion timelines.

*Note #2:* The prerequisite (or corequisite) for this course is BEHG 101: Introduction to Behaviorology I. If you have not had this prerequisite course (or its academic–credit equivalent such as SSCI 245: Introduction to the Science and Technology of Behavior, from SUNY–Canton), then you need to take it before taking this course for TIBI credit.

### Course Description

*BEHG 420: Performance Management and Preventing Workplace Violence.* This course examines the application of the natural science and technology of behavior to the understanding, prevention, and deterrence of workplace violence, and does so on three levels: The course examines the scientific analysis of punishment as punishment informs many practices present in workplace settings that match the violence–prone profile. Next, the course emphasizes the acquisition and application of the behavior management–related knowledge and skills, known as performance management, that are relevant to changing the circumstances that lead to workplace violence so as to *prevent* its possible occurrence. Then the course extends its systematic and data–based behaviorological orienta-

tion from the understanding of workplace violence, and its prevention, to developing, comparing, applying, and evaluating policies and procedures to intervene in the dynamics, indicators, types, and triggers of workplace violence to *deter* its imminent occurrence. These three levels are considered for all workplaces including those in industrial/manufacturing, marketing, financial, institutional, organizational, or retail business settings.

*Note #3:* To check out other behaviorology courses offered by TIBI, visit their locations on the TIBI web site (www.behaviorology.org).

To check out other behaviorology courses offered by SUNY–Canton, see the list and descriptions—and in some cases, the syllabi for the asynchronous versions—on the faculty web page of the professor who teaches them (which currently is Dr. Stephen F. Ledoux; click Ledoux in the faculty directory at www.canton.edu).

### Course Objectives

The main objective of the course is to expand the student's behavior repertoire in relevant areas of behaviorological course content. The student will:

❧ Summarize the scientific analysis of punishment and coercion, and its implications for behavior engineering efforts, especially as related to workplace violence.

❧ Demonstrate the behaviorological knowledge and skills relevant to changing the circumstances that lead to workplace violence so as to prevent its occurrence;

❧ Compare the range of best practices available to resolve problems in particular cases;

❧ Apply appropriate strategies for similar cases in different settings;

❧ Evaluate the outcomes of various violence–prevention methods.

❧ Incorporate behavior engineering into the policies and procedures to deter the imminent occurrence of workplace violence;

❧ Analyze the dynamics, indicators, types, and triggers of workplace violence;

❧ Adapt or develop appropriate policies and procedures for a particular type of workplace setting;

❧ Evaluate the effectiveness of various policies and procedures in deterring imminent workplace violence in a range of settings.

### Additional Objectives

❧ Successful, A earning students will use (at an accuracy level of 90% or better) relevant disciplinary terminology when discussing (a) the scientific basis of violence in society, (b) the performance–management skills whose application prevents so much violence of all types in all workplaces, and (c) the policies, and intervention strategies, appropriate to deterring workplace violence.

❧ Such successful students will also ask questions, seek answers, converse about, and act on the uses and benefits of this discipline for humanity.

❧ Such successful students will also behave more effectively in other ways with respect to themselves and others.

## Required Materials (in their order of use)

❧ Sidman, M. (2001). *Coercion and its Fallout.* Boston, MA: Authors Cooperative.

❧ Kopp, J. (2001). *Coercion and its Fallout Study Guide.* Boston, MA: Authors Cooperative.

❧ Daniels, A.C. (2000). *Bringing Out the Best in People.* New York: McGraw–Hill.

❧ Ledoux, S.F. (in progress). *Study Questions for Aubrey Daniels' Bringing Our the Best in People.* Canton, NY: ABCs.

❧ Nicoletti, J. (1996). *Violence Goes to Work.* Denver, CO: Mountain States Employers Council, and Lakewood, CO: Nicoletti–Flater Associates.

❧ Ledoux, S.F. (in progress). *Study Questions for Violence Goes to Work.* Canton, NY: ABCs.

The first two of these required books carry over as part of other behavior engineering topic courses of possible interest to you (e.g., *Rehabilitation*, and *Preventing School Violence).*

## Recommended Materials

If you think "employees" when this video program speaks of families, then it may be of interest to you in going deeper into the course topics and extensions:

❧ Latham, G.I. (2–part video program). *The Making of a Stable Family.* Logan, UT: P&T ink.

*Note #4:* The simplest way to order most of the required *books* and *A/V items* is through the publishers, including *ABCs* at 315–386–2684, and *Mountain States Employers Council* at 303–839–5177 (or *Nicoletti–Flater Associates* at 303–989–1617) and *P&T ink* at either 435–752–5749 or—toll free—(for credit–card orders only) at 1–888–750–4814. They may also be available through the online bookstore at www.behavior.org which is run by the Cambridge Center for Behavioral Studies.

Also, this course is grounded in the Shaping Model of Education which is informed by behaviorological science (rather than the Presentation Model of Education which is informed by psychology). In the shaping model teaching is not seen as mostly talking (nor is learning seen as mostly listening). Instead, teaching is the scientifically grounded design, arrangement, and application of educational materials, methods, and contingencies in ways that generate and maintain small but continuously accumulating behaviors the short and long range consequences of which are successful in producing an ever wider range of effective responding (i.e., learning) on the part of the student.

## Grades

Grading policy does not involve curves, for you are not in competition with anyone (except perhaps yourself). That is, all students are expected to produce the academic products demonstrating that they have, individually, achieved at least mastery of the subject matter, if not fluency. Therefore, all students are expected to earn an A or a B (although inadequate products will produce a lower result that requires remediation before it can become a passing grade). Also, all students will receive the grades they earn. This holds even if the expectation for which the course is designed—that all students earn *A*s—is met: If all earn *A*s, then all receive *A*s.

Passing grades are limited to A and B, and are earned according to the amount of assigned work that is successfully completed:

Earning an A consists mainly of satisfactorily completing 90% or more of the work on all assignments.

Earning a B consists mainly of satisfactorily completing more than 80% of the work on all assignments (but not more than 90% on them).

For convenience a point–accumulation system is invoked to keep track of progress through the course. The assignments on the *Coercion and Its Fallout* book are worth 100 points (5 points for each of the 20 assigned chapters). The assignments on the *Bringing Out the Best in People* book are also worth 100 points (20 points for each of the five assignments). And the assignments on the *Violence Goes to Work* book are also worth 100 points (30–35 points for each of the three assignments). This provides a grand total of 300 possible points. The grade that you receive is partly based on the percentage of these possible points that you actually earn.

However, point accumulation is not the grade determiner but is merely used as a convenient way to track progress *on the presumption that all course tasks are in progress.* This is because doing work on *all* of the tasks for the course is the more relevant determiner of grades than is the accumulation of points. (For example, a student who tries to accumulate just enough points, on some easier tasks, to get a B—while ignoring other course tasks—would not that way actually meet the criteria for a B and so would have to continue and complete all the required work satisfactorily to earn one of the passing grades.)

Also, students should expect to be asked occasionally to complete various test–like assessments. The level of success on these assessments helps gauge the extent to which the work on the course assignments is actually producing the learning implied by the completion of that work.

These practices are in place because the scientific research–data based Shaping Model of Education recognizes the student/professor relationship as a professional relationship in which coercive practices (i.e., aversive

educational practices) are seen as inappropriate (so long as extreme conditions do not exist making such practices unavoidable). Instead, the more effective, efficient, and productive non–coercive practices of carefully designed and sequenced assignments emphasizing added reinforcement for timely work well done is generally seen as more appropriate. So, your effort and cooperation are expected and presumed; please do not disappoint either your professor or yourself.

### About Using the Texts & Study Question Books

Unless specified otherwise, you need to write out your answers in longhand. The reason you are to write out your answers by hand is that this type of verbal response brings about more learning than merely saying—or even typing—the answer. This is because—as taught in another advanced behaviorology class (i.e., BEHG 355: Verbal Behavior I)—writing the answer in longhand involves both point–to–point correspondence and formal similarity between the stimuli and the response products of the answer.

### The Coercion Book

The *Coercion* book introduces students to the problems resulting from coercion and punishment—the scientifically discovered basis of most of the violence throughout society, including in the workplace—and the general scientific approach to solving those problems. Read the chapters and answer the study questions that cover those chapters. Assignments are provided in the *Assignment Sequence* section.

### The Best in People Book

The *Best in People* book takes students through the scientific principles of behavior and their workplace applications by covering the development of the personal, positive, proactive, non–coercive and effective performance–management practices and skills that are vital both to successful management of workplaces, and to *preventing* all levels and types of violence in workplaces. Read the chapters and answer the study questions that cover those chapters. Assignments are provided in the *Assignment Sequence* section.

### The Violence Goes to Work Book

The *Violence Goes to Work* book provides students with the knowledge, policies, and intervention strategies appropriate to *deterring* incipient, potentially lethal workplace violence. Read the chapters and answer the study questions that cover those chapters. Assignments are provided in the *Assignment Sequence* section.

### The Study Question Books

Each textbook (*Coercion, Best in People,* and *Violence Goes to Work*) has a book of study questions. These were prepared to help you expand your behavior repertoire based on the material in each textbook. You are to complete each textbook's study questions in the sequence assigned because learning occurs when reinforced responses are made (like writing question answers), especially responses that automatically provide their own reinforcing consequences (like being right) as does writing out study question answers correctly. You complete the assigned study questions, *after reading the chapter through,* by *writing out* the answer to each question when you come to each question as you *reread* the chapter. You *write out* the answers right in the *Study Question* book. Write out your answers in full sentences that incorporate the questions. Check all your answers. And make any corrections that you find you need to make as you review and learn the material.

The study question book starts with a section titled To the Student and Teacher. *Read this section first!* It explains more on how to do the study questions successfully. (You may also find it helpful to mark the number of each study question in the margins of the text at the location of the study question's answer.) Assignments are provided in the *Assignment Sequence* section. Submit your work according to the method specified in the *Submitting Your Work* section.

*Note #5:* Since you are to write out your answers to the study questions directly in the study question books, you need to have your own study question books. To assure that this is followed by everyone equally, you need to fill out and send in to your professor (by regular postal mail) the original ownership forms in the rear of your ABCs–published study question books.

### Submitting Your Work

The study question answers and the web log have different work submission methods. These only apply if you are taking the course for TIBI credit. (Any addresses and phone/fax numbers that you may need will be clarified upon enrollment.)

To submit your study question answers, which must be hand–written, you can scan and fax to your professor the pages that have your answers for each assignment. However, your professor would prefer that you photocopy those pages and send them to your professor by regular postal mail.

To submit your web log, you may email your work to your professor (but do not use email attachments). Or, you may scan and fax it to your professor. However, your professor would prefer that you print out your work (although it too may be handwritten), photocopy it, and send it to your professor by regular postal mail.

In all cases, you are to keep the original of your work. This insures against loss and enables you and your professor to communicate about your work (as you will then

both have an identical copy). Note, however, that for study question answers, email and email attachments are neither reliable enough, nor identical enough, for this purpose, so they are not to be used for this purpose.

Your work will be perused and points will be allocated according to the quality of your work. Should any inadequacies be apparent, you will be informed so that you can make improvements. While sometimes your professor will provide a metaphorical pat on the back for a job well done, if you do not hear of any inadequacies, then pat yourself on the back for a job well done even as you continue on to the next assignment.

### Assignment Sequence

Students should work their way through the course by reading and studying the texts and materials, and sending in their work for each assignment. The slowest reasonable self–pacing of the coursework (presuming a typical 15–week semester) is this sequence which can be used as a check off list:

Week 1:  The *Coercion* book: Intro. and Chs. 1 & 2.
Week 2:  The *Coercion* book: Chs. 3, 4, 5, & 6.
Week 3:  The *Coercion* book: Chs. 7, 8, & 9.
Week 4:  The *Coercion* book: Chs. 10, 11, 12, & 13.
Week 5:  The *Coercion* book: Chs. 14, 15, & 16.
Week 6:  The *Coercion* book: Chs. 17, 18, & 19.
Week 7:  The *Best in People* book: Part 1.
Week 8:  The *Best in People* book: Part 2.
Week 9:  The *Best in People* book: Part 3.
Week 10: The *Best in People* book: Part 4.
Week 11: The *Best in People* book: Part 5.
Week 12: The *Violence Goes to Work* book: pages 1–26.
Week 13: The *Violence Goes to Work* book: pages 27–63.
Week 14: The *Violence Goes to Work* book: pages 65–103.
Week 15: Complete any unfinished work.

Do the assignments in this sequence, even if you do them at a faster pace than the pace presented here. If you go slower than this schedule, assignments could easily back up on you to the point where insufficient time remains to complete them in a satisfactory manner.

*Note #6: Be sure that everything you submit is readable and contains your name!*

*Note #7:* The usual higher education workload expectation for a course is about 150 hours. (The typical face–to–face course features about 50 in–class contact hours with the university expecting about 100 more hours of additional study at the average rate of about two hours out of class for each hour in class.) This can be accomplished at rates ranging from about 50 hours per week over three weeks to about ten hours per week over the typical 15

weeks of a semester. Of course, some students may take a little less than 150 hours, while others may take more than 150 hours, to do the work to the same acceptable and expected standard.

You can—and are encouraged to—go through the assignments as rapidly as your schedule allows. This could mean spending a typical 15 weeks on the course. Or it could mean doing the whole course in as little as—but not in less than—three weeks, as one would progress through the *single* allowed course in a three–week summer school term. That is, you could work on the course anywhere from minimum part–time (i.e., at the rate of about ten hours per week, as described in the *Assignment Sequence* section) to maximum full–time (i.e., at the rate of about 50 hours per week).

If you are to be successful, you need to exercise some self–management skills by starting immediately and keeping up a reasonable and steady pace on the course work. You need to do this because your professor will *not* be reminding you that the products of your work are due; all the course work is set forth in this syllabus and so is automatically assigned. You are expected to follow through on your own. You need to set an appropriate pace for yourself (or accept the pace in the *Assignment Sequence* section) and adhere to that pace, and thereby get the sequence of assignments done and submitted to your professor. This will assist your success.

At various points in the course, you will be provided with feedback about your work. Upon completing all the coursework, you will be provided with your earned grade. (The grade is provided solely for the person whose work earned the grade.) We at TIBI are sure that the outcomes of your efforts to study this aspect of behaviorological science will benefit both you and others, and we encourage you to study further aspects.❧

# Preface to Coercion and Its Fallout

## Murray Sidman

*Northeastern University*

[The second half of the last chapter (chapter 19) of Murray Sidman's book *Coercion and Its Fallout* (published in 2001 by Authors Cooperative of Boston, MA.) appeared in the last issue of *Behaviorology Today* (volume 6, number 2, pp. 30–35) as an article under the title "Reinforcement in diplomacy: More effective than coercion." To complement that article and, moreover, to encourage further investigation of the *Coercion and Its Fallout* book and the issues that it raises and the solutions that it proposes, the Preface to that book appears in this issue (reprinted with permission).—Ed.]

*I* wrote this book to say some things I have long thought needed saying not just to professional colleagues but also to all thoughtful people who are concerned about where we are going as a species. Even as a teenager, I had somehow become aware that the world was unwinding. It had real problems and was not facing up to them. My view was colored not just by personal experience; that was really quite limited. My family was really relatively secure and nonpunitive, and my most severe stresses came from the roving gangs that occasionally swept into our neighborhood looking for kids to beat up. But I was also a reader, and what I read about people's senseless cruelty and hypocrisy was almost unbelievable. How could human beings do the things they were always doing to each other? The prevailing themes in news reports or in novels were wars, murders and other kinds of personal violence, political and religious suppression, unscrupulous business and political dealings, betrayals of friends and lovers, mental illness, and petty egocentrism. And as if to confirm my dismay, World war II broke out just when I became old enough to take part.

Right after World war II, most of us did not yet understand the enormity of the destructive force that had been let loose. We had not resigned ourselves to the possibility that our generation might be the last. General skepticism about whether things could ever get any better had not yet set in. It was still easy to find peers and even older people who believed it did not have to be the way it was. And the end of World war II seemed somehow to mark a possible new beginning. The really large evil forces in the world appeared to have been wiped out; perhaps we could now continue, getting rid of the rest of the senseless violence we characteristically subjected each other to. But it has not happened that way. Why not?

The big question was, "How to go about it?" How to bring about the changes that our society, exhausted by destruction and suffering, seemed ready for? Most of the proposed solutions involved changes in our institutions. For some, a new form of government was the answer. Others could see progress only in the context of an altered economic system. Still others believed that education was the key. But there was a catch to all proposals for political, economic, or educational reform. Those institutions, those systems, were not handed to us from the outside, ready made. We made them ourselves. Whatever virtues and weaknesses our institutions had were our own virtues and weaknesses.

It has become clear that the primary problems lie not in our institutions but in us. Somehow, we have to change ourselves if we are to build systems that will support cooperation, sharing, justice, and generally rational approaches to the problems that inevitably arise when large numbers of people have to share limited resources.

How are we to change ourselves? Many kinds of proposals have been made. Anthropologists long ago recognized that as a species, we have not yet completed our physical adaptations to our two–legged posture, to soft food, to the prolongation of life through sanitation and preventive medicine. We suffer much illness and distress because our upright posture provides proper support neither for our innards nor for the arches of our feet; our diets are making our teeth largely unnecessary; many immunological processes, no longer needed to protect us from environmental changes, show up instead as allergies; and with physical illness during our earlier years playing a lesser role in determining the duration of our lives, aging brings with it still new diseases. Some hold that leftovers from our physical heritage generate suffering and misery, keeping us at each other's throats. They suggest that the world would be a better place if we just got rid of all those whose physical suffering was making them impossible to live with. Their solutions include improvement of the species through radical euthanasia, getting rid of rather than prolonging the lives of those who are born with defects or who acquire defects because they live too long.

Extreme euthanasia, doing away with anyone who suffers presumed deficiencies, has been tried on a large scale more than once. The attempts by the Nazis made obvious the horrors inherent in arbitrarily defining what is meant by "deficiency," in specifying what is a "problem," and in determining what is "desirable." Furthermore, doing away with the aged and infirm—those who are no longer producing and bearing children—could have no effect on the evolution of the species. And if we were to attempt to achieve "genetic purity" at the other end—

doing away with physically and mentally deficient children—the evolutionary process would still take hundreds of generations. That time frame is not available to us.

Proposals to produce a healthier and perhaps more agreeable species through controlled breeding possess the same flaw—we do not have enough time. Modern advances in genetics do indicate that rapid changes will become possible in the not too distant future. How close that future is, we do not yet know with any certainty. We know even less about how genes and conduct are related. What kinds of inheritance will make us apply our full intelligence to our most critical problems? What genetic changes will make us respond to frustration with reason rather than aggression? Can we clone teachers who will use positive rather than coercive methods to teach the young? And so on. Even if it proves possible to use our developing understanding of genetics to speed up the normally slow evolutionary process, it is not at all clear that we are going to find out how to do this advantageously before we do each other in.

What few have considered is the possibility that we can bring about behavioral change without altering our biological processes or our genetic makeup. In the last 60 years, behavioral analysis has taught us much about how the environment influences behavior. Within the limits of our current biological inheritance, our conduct is strongly controlled by its environmental setting and its environmental consequences. Behavioral analysis has also shown us that self–control is really environmental control; it is possible to engineer changes in our own environment so as to bring about changes in our own behavior. To control ourselves is to change the environment in such a way as to change our own conduct, and to do so because it changes our own conduct. There is so much room for change, even without genetic manipulation, that altering some of the critical relations between environment and behavior is the only practical route to travel if we are really to change our conduct before it is too late.

A widespread but erroneous view holds that only superficial alterations can be brought about this way. Many still believe that an analysis of relations between our conduct and our environment does not get at our real nature. We like to see ourselves as independent agents, not as a locus of controlling variables. For many, the "real me" consists of those innermost feelings, thoughts, and yearnings that nobody else can ever know. And it is true, nobody else can ever know our "inner person" through direct experience. Granting that, we must also acknowledge that as far as the rest of the world is concerned, the "real you" is what they can see. That is all others can deal with. And what they can see, what they can deal with, are our actions. We may regard our inner person as our true self, but to the rest of the world, we are what we do. If we are going to change our interactions with each other, we are going to have to change what we do. By changing our conduct, we change ourselves.

I have attempted in this book to indicate a critical kind of change that will have to take place in our social interactions if we are ever to do something constructive about the miseries we currently inflict on each other, if we are ever to at least postpone the current headlong rush toward extinction of the species. Coercion is not the root of all evil, but until we adopt other than coercive ways to control each other's conduct, no method of physically improving our species will keep our survival timer from running out. A developing science of behavior may again give people of good will cause for optimism about our chances for survival.❧

[You have now read both the beginning and the end of Sidman's book *Coercion and Its Fallout* (the Preface, in this issue, and much of the last chapter, in the last issue). All of the material between these points—which you can read by obtaining the book—builds on the experimental research that underlies Sidman's detailed analysis of the effects of coercion across the range of human interests—including at home, in school, at work, within governments, and among nations. This analysis then provides the basis for his reasoning that further applying scientific principles and concepts of behavior to reducing coercion throughout society would be beneficial. Again, these parts of the *Coercion and Its Fallout* book appeared in this journal to encourage further investigation of the book and the issues that it raises and the solutions that it proposes.—Ed.]

## References

Sidman, M. (2001). *Coercion and Its Fallout—Revised Edition.* Boston, MA: Authors Cooperative. (ISBN 1-888830-01-8).☙

# An Introduction to the Origins, Status, and Mission of Behaviorology

## Stephen F. Ledoux

*SUNY–Canton*

[This paper began as part of an invited address to faculty and graduate students of the School of Management at Xi'an Jiaotong University (Xi'an, Shaanxi, People's Republic of China, 20 March 1991), as well as to other Chinese audiences, all of whom wanted a brief introduction to the concept of an independent natural–science discipline of behaviorology, separate from any non–natural science discipline. As indicated by its title, it also serves as the introduction to a larger work (i.e., Fraley & Ledoux, 2002). This paper is included here to encourage continued consideration—by older and newer audiences—of the historical events and directions that it covers.—Ed.]

*B*ehaviorology? What is that? Where does it come from? How does it differ from other disciplines and fields that evince some interest in why people do what they do? How is it related to other disciplines and fields? How much is encompassed by behaviorology, such as its contributions? Why should anyone learn anything about behaviorology? Questions such as these typically arise when people first come across the term *behaviorology.* This paper presents some initial answers to these questions by surveying an analyzed history of the origins of the discipline of behaviorology and the behaviorology movement. The survey includes some corroborative evidence from the status of behaviorological science in China. (For elaboration of the points introduced in this paper, see Fraley & Ledoux, 2002, and Ledoux, 2002a, b, c.)

## What is Behaviorology?

Put too simply, behaviorology is the science and technology of behavior relations. This may appear similar to the way some other disciplines define themselves. A more elaborate definition, an expansion of the definition written for the By–laws of TIBA, The International Behaviorology Association (an expansion undertaken when experience indicated some lingering confusion over the discipline's range and depth of coverage), should help discriminate between behaviorology and those other disciplines:

Behaviorology, a comprehensive discipline with philosophical, experimental, analytical, and technological components, is the natural, life science, emphasizing the causal mechanism of selection, that discovers, interprets, and applies the simple and multiple variables that are in functional relations with the simple and complex, overt and covert behaviors of individual organisms (especially people) during their lifetime (and beyond, with respect to cultural practices), and that takes into account socio–cultural and physical variables from the environment as well as variables from the biological history of the species.

Here is a simpler way to present that full definition:
The discipline of behaviorology,

- ❧ being a comprehensive discipline with philosophical, experimental, analytical, and technological components,
- ❧ is a natural, life science;
- ❧ emphasizes the causal mechanism of selection;
- ❧ discovers, interprets, and applies the simple and multiple variables that are in functional relations with the simple and complex, overt and covert behaviors of individual organisms (especially people) during their lifetime (and beyond, with respect to cultural practices); and
- ❧ takes into account socio–cultural and physical variables from the environment as well as variables from the biological history of the species.

## Where Does Behaviorology Come From?

As a current *discipline*, behaviorology comes from the interaction of the previously developed behaviorological science and technology with the current behaviorology *movement*. The conditions under which the original behaviorological science and technology developed gave rise to the current behaviorology movement, and that movement has enabled recognition of the current, independent disciplinary status of behaviorology.

### Science and Technology Origins

The science, and the technology originally developed from the science, began about seventy years ago, early in the career of B.F. Skinner. Paradigmatically, Skinner never really was a psychologist in the sense of accepting the *transformation* paradigm of psychology. Sometime

during his work in the 1930s, he began using the life–science *selection* paradigm, typical of the natural science of biology, in the task of developing a natural science of behavior, especially the behavior of people. Skinner was operating within a department of psychology (a discipline with a fundamentally mystical philosophical core) at Harvard University. However, he did much of his pre–graduation work under W.J. Crozier, the head of the physiology branch of Harvard's biology department (Skinner, 1979, p. 16). Crozier had been a student of the biologist Jacques Loeb, and both Crozier and Loeb had emphasized the causal mechanism of selection in their natural science work. Skinner, perhaps without initially realizing he was doing so, transferred the concept of selection from biology to behavior relations. He thereby brought a particular, natural science paradigm to bear on the questions of a scientific study of behavior.

With respect to behavior, selection refers to the lasting effects, on a person's or other organism's behavior, of the consequences of that kind of behavior. For example, a child who must ask (the response) loudly and repeatedly for a cookie before receiving one (the consequence) is a changed person. He or she is changed physically and thus behaviorologically by the occurrence of the consequence. The consequence alters the bodily structure in a manner that can be observed at the physiological level and at the behaviorological level. At the physiological level the alteration can be seen as nervous system changes the specifics of which physiologists are making better known. At the behaviorological level it can be seen as a changed behavior repertoire in that, in the future, asking–for–cookie responses will be even louder and more persistent. These inseparable effects occur because receiving that past cookie selected for loud and persistent asking. Selection causes physical changes now that are seen as altered behavior later.

Behaviorologists address those altered behaviors by referring to the probability of behavior and changes in that probability occasioned through selection by consequences; consequences select behavior to occur more often or to occur less often. In selection causality on the behaviorological level, a response A is followed by (and usually has actually produced) a consequence B. The occurrence of B leads to responses of *class* A being more, or less, likely to occur again in the future. That is, in the selection causal mode, B *affects (class)* A. Selection is thus a type of causal mode different from the more familiar mechanical causal mode where A *leads to* B. In the mechanical mode, for example, too high a temperature in cooking (A) burns the food (B), or, in reflexes, an increase in light (a stimulus, A) elicits a decrease in pupil size (a response, B). With selection causality, at the level of the behavior of organisms during their lifetime, behavior is selected *by its consequences* to occur again or not; from this arises the more

common term, *selection by consequences* (see Ledoux, 2002d, for more detailed terms).

The specifics of selection causality operate differently at other levels of life science (while the shared use of selection causality attests to the interrelationships of the disciplines at all levels of life science). On the biological level, selection causality affects species through natural selection. On the level of cultures, selection causality involves selection of cultural practices. (Among natural sciences, a mechanical causal mode is emphasized in physical sciences while the causal mode of selection is emphasized in life sciences.) Behavior is functionally related to many other variables as well, but the selection mechanism is usually a necessary component of those relations (e.g., stimulus control variables). The relationships found in nature between all these variables and behavior are described by, and often as a group referred to as, the natural laws, or nature's laws, of behavior.

In conjunction with the philosophy of science called radical behaviorism, decades of research by Skinner and those trained in this new approach followed Skinner's use of the paradigm of selection by consequences as the fundamental component of studying behavior. (See Ledoux, 2002a, for an introduction to some basic elements of radical behaviorist philosophy; the selection paradigm is not included as one of those elements even though, for behaviorologists, this philosophy and paradigm may have become inseparable.) The efforts of Skinner and those other researchers produced discoveries of the elementary natural laws involving the behavior of organisms. By the 1950s, those researchers were developing technologies to change accessible environmental variables and so produce behavior change. Further, they were applying these technologies to improve various aspects of the human condition. These applications help people to do more, act better, and behave more effectively in all facets of life, for example, in child care, health care, education, daily living, work, leisure, art, entertainment, academic pursuits, and even science itself.

Ever since those early discoveries and applications, new generations of researchers have continued to make further advances, discovering more complex principles and interactions and developing more complex technologies. The application of these technologies extends into ever wider areas, continually improving personal and cultural practices. The term *behavioral engineering* provides a general description of these applications for it suggests both the technical process of changing the relevant environmental variables and the resulting changes in behavior. (This name, behavioral engineering, supersedes an earlier name, behavior modification, partly because the older name is misleading. The older name implies that behaviorological practitioners *directly* manipulate behavior whereas they actually arrange—engineer—changes of the

particular environmental variables related to the behavior of concern, with the result that the behavior changes.)

## Movement Origins

The behaviorology movement encompasses the efforts of behaviorologists in developing professional organizations and academic homes to preserve and extend the behaviorology discipline and its contributions to humanity. This movement arose from the conditions under which the original behaviorological science and technology developed. Those conditions involved incommensurable differences between a discipline of behaviorology and the discipline of psychology, especially concerning their respective paradigms. Incommensurable differences are differences that are incompatible, and that cannot be compared like those between apples and ghosts.

Lett (1987) explains paradigmatic incommensurability as "the question of whether rival theories can be compared and evaluated according to a standard measure" (p. 35). Lett also points out that alternative paradigms need not be incommensurable:

> If two paradigms agree about the nature of the problem to be solved and about the appropriate means of solving that problem, they are commensurable. Furthermore, paradigmatic commensurability is a relative matter. Two paradigms may agree about the problems to be investigated but disagree as to the means of solution. Scientific evolution and "scientific creationism," for example, are both concerned with the origins of the human species, but the two paradigms have radically different epistemological principles. If one paradigm chooses to rely upon experience as its epistemological foundation, it can make no impact upon a paradigm that appeals ultimately to revelation. (pp. 35–36)

So, "if the participants in such a debate restrict themselves to the terms and assumptions of their own paradigm, they can have nothing to say to one another" (Lett, 1987, p. 36). They are incommensurable (see Ulman, 1992, for elaboration).

Behaviorological science had arisen and existed for some decades, mainly within the realm of psychology, before the accumulating effects of incommensurable differences required independence–oriented actions. During this time, behaviorological professionals had become accustomed to trying (and failing) to change psychology fully into a natural science of behavior. By the 1960s the differences between the two became more openly incommensurable. Events in later decades showed more and more why the earlier strategy of trying to remake psychology was inappropriate (see Fraley & Ledoux, 2002). But the momentum of decades of that strategy was hard to break.

Behaviorological professionals found considering other strategies difficult. Some of them finally did so however, and thereby initiated the behaviorology movement.

***Effects of incommensurability.*** By the 1970s, behaviorological professionals were experiencing the *effects* of the incommensurability of their science and psychology. (By this time they were called behavior analysts, the name still used by, among others, some professionals trying to engage in behaviorological science, with its selection paradigm and radical behaviorist philosophy of natural science, within the mystical discipline of psychology.) The effects of incommensurability are varied. Some concern the extent to which behaviorology can make its contributions to the culture. Others concern employment opportunities and the control of disciplinary infrastructures. And still others exist also (Fraley & Ledoux, 2002).

One effect of incommensurability was that within psychology the science of behavior was increasingly underrepresented, underfunded, de–emphasized in most departments, and simply dropped in others. As a result, students were less and less able to receive training in the science of behavior. (Ledoux, 2002b, provides a description of some behaviorology curricula in higher education. The contents of these curricula reflect the depth and range of the behavior science training unavailable in psychology.) Students covered few courses related to the science of behavior in their degree programs because few were offered by psychology departments. More likely, the student's required exposure to the laws of behavior involved a single chapter, or part of a chapter, from the twenty or so included in standard introductory psychology textbooks. And those chapters not only typically misrepresented behavior science (e.g., the usual confusion between negative reinforcement and punishment) but also they were increasingly out–of–date; researchers were reporting advances in behaviorological work mostly in journals *outside* those of the usual psychology literature perused by textbook authors.

With so little exposure, substantial interest in the science developed in fewer students. Those who did become interested usually did so due to studying under a behaviorologically oriented faculty member. But the opportunities to do that were also decreasing. After reducing the number of behavior science courses, programs reduced the number of behavior science faculty. So even interested students could not easily be fully trained in the science of behavior and its applications; not enough courses or teachers were accessible. But these students still had to take plenty of courses covering unparsimonious, non–natural science in their programs. As a consequence these fewer, newer natural scientists of behavior were less trained in the available behaviorological science than they might have been (and perhaps less trained than the earlier generations of faculty and personnel whom they re-

placed). So they were likely to be less effective than they could have been as scientists, as teachers, and as behavioral engineers, and so were *their* students, and so on.

If those effects of incommensurability were the only ones, and no effective actions occurred to change that trend, the long term result could have been the practical disappearance of an effective and advancing scientific and systematic approach to people's behavior and how to change and improve it. Fortunately, positive effects of incommensurability were also detectable, along with appropriate and supportive actions to consolidate and further advance the science. For instance, personnel in various cultural agencies were increasingly looking specifically toward behaviorological science as the provider of effective behavioral engineering, relevant to their concerns. To mention but a few, these personnel included (a) educators looking beyond the typical resources of their field, (b) workers and managers in business and industry looking for ways to increase productivity and job satisfaction, etc., and (c) government units, especially at state level, responsible for services to citizens with disabilities. (For example, in the 1970s some California state officials wanted to spot whether or not applicants for certain jobs had specific training in behavior management. To make this easier to do, Joseph Morrow, a behaviorological scientist at California State University, Sacramento, arranged for students to receive a "Certificate in Behavior Modification"—using the designation common at the time—if their studies included a particular pattern of courses that specifically expanded their skills in the area of behavioral engineering.)

***Early independence actions then the behaviorology movement.*** From the 1960s through the 1980s, both positive and negative effects of incommensurability prodded some initial actions, early moves towards independence. Behavior analysts founded numerous behavioral journals and their own professional organizations. Most of these were separate from psychology's literature and organizations. None of them, however, openly espoused the disciplinary status implied by the incommensurable differences with psychology. Some behavior analysts and behaviorological professionals also founded academic programs (especially at the graduate training level). Many of these programs were also organizationally independent of psychology through their association with academic departments representing various applied behavioral *fields* which could be informed by various disciplines, including behaviorological science (e.g., special education). A few programs functioned with the status and structure of a separate *discipline* by forming a natural science training alternative in a distinct department separate from their respective university's psychology department. These departments, typically describing themselves with the term *behavior analysis* (the term *behaviorology* not yet being in

use at their founding), did begin to reflect the independent disciplinary status implied by the incommensurable differences with psychology.

The effects and implications of incommensurability made the need for separation into independent disciplines increasingly clear. Some behaviorological professionals finally began to take the necessary actions. They contributed to the academic debates (which began in earnest in 1984) in the behavior–analytic literature about an appropriate name and directions for the comprehensive natural science discipline concerned with behavior relations. In 1987 they (a) formally recognized the separate and independent status of that discipline, (b) accepted *behaviorology* as the name denoting that discipline, and (c) founded the scientific organization that came to be called The International Behaviorology Association (TIBA) and is now called the International Society for Behaviorology (ISB). By the end of 1992, their organizational efforts were reflected in (a) a continuing series of annual conventions with, as a sample, the second in Mexico at the Los Horcones community in January 1990, and the fourth in New Orleans, USA in January 1992, (b) a newsletter, originally called the *TIBA Newsletter,* and now called *Selections,* (c) a carefully planned, comprehensively peer–reviewed disciplinary journal to appear in 1993, called *Behaviorology,* (d) a non–copyright–retaining journal, with short–process peer reviewing, called *Behaviorological Commentaries* for articles that fall between the respective domains of the newsletter, *Selections,* and the journal, *Behaviorology,* and (e) the allocation of one–fourth of all dues explicitly for the support of behaviorological research.

## How Does Behaviorology Differ From Other Disciplines and Fields?

The original question was longer: "How does behaviorology differ from other disciplines and fields that evince some interest in why people do what they do?" An initial response is that behaviorology is interested in more than this. It is also interested in *what can be done* about what people do.
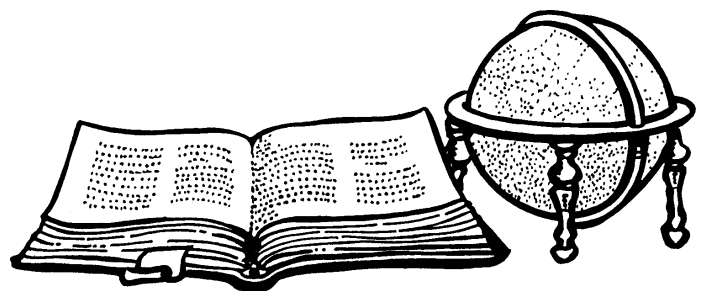
Encompassing this difference, and substantiated by other differences (in philosophy of science, subject matter, methodology, etc.), is the fundamental and incommensurable difference in paradigms between behaviorology and these other disciplines and fields. So most of this answer focuses on the paradigm difference. (See Vargas, 1991, whose names for the paradigms are used here; also see Fraley & Ledoux, 2002, for additional details, including consideration of the other differences as well.)

## Of Paradigms and Eclecticism

The two paradigms are the *selection* paradigm Skinner had adopted from biology and the *transformation* paradigm of psychology and some other disciplines. Psychological subscribers to the transformation paradigm are most interested in positing (with emphasis on a hypothetical–deductive model) the causes of behavior chiefly in the transformations that they believe occur inside the person. These are the transformations that external variables (inputs, to use current cognitive terminology) seem to undergo before becoming apparent as behavior (outputs) in a basically mechanical causal mode. Since this paradigm does not support much interest in the inputs or outputs for their own sake, the possibility of, and consequently concern for, effective control is diminished. In contrast, behaviorological subscribers to the selection paradigm are most interested in discovering (with emphasis on an inductive model) the causes of behavior chiefly in the genetically affected, potentially manipulable behavior–environment interactions, with selection by consequences as the fundamental causal mode. Since this paradigm explicitly supports interest both in behavior for its own sake and in the variables of which behavior is a function, the possibility of, and consequently concern for, effective control is enhanced.

Psychology's transformation paradigm has played a particular role regarding eclecticism. Psychologists have generally considered their discipline as an eclectic aggregate. Their eclecticism seemed originally pragmatic. It allowed them to search along multiple paths for an effective approach to the general question of "Why do people do what they do?" But could it allow them to find such an approach? They were convinced that multiple, eclectic paths constituted the best course for them to follow. However, their eclecticism had no built–in need for resolution. They could continue working under eclecticism indefinitely (and have been doing so). Eclecticism actually *does not require* either ultimately adopting, or even looking for, an effective approach. Indeed, the notion of an effective approach, as in a single, substantive, systematic, comprehensive approach, seems to be anti–eclectic by definition. In addition, as psychologists were to discover, they already *shared* a paradigm, the transformation paradigm, that allowed them their eclectic differences. So

the availability of a more effective approach, especially one with a different and incommensurable paradigm, evoked little interest. Psychologists' paradigm and eclecticism remain thoroughly intertwined.

The fact that different schools and approaches divided psychology merely masked its otherwise characteristic transformational paradigmatic unity. Psychologists' stress on eclecticism focused on differences in emphases and particulars of the various schools and approaches. Consequently they have only gradually apprehended their common transformation paradigm. Outside psychology critics often complained about the apparent lack of a unifying paradigm in psychology, thereby casting doubts on the disciplinary status of that aggregate. The critics also seemed influenced by the differences in emphases in the various psychological approaches. So they too were distracted from apprehending the basic paradigm. In defending against these criticisms, psychologists stressed their eclecticism since they had not yet clearly recognized their paradigmatic unity. They stressed it to the point that the previously pragmatic eclecticism became an inherent aspect of their self–description (as passed on by countless repetitions throughout a psychology student's training).

Conveniently, however, the transformation paradigm not only encompasses the similarities of psychologists' perspectives but also allows them their eclectic, even contradictory differences. Most psychologists, regardless of eclecticism or perspective, seem little interested in behavior or the variables of which it is a function. They are little interested in inputs (the variables) and outputs (the behavior). They try to relate these mainly for other reasons, and by adapting an older (and changing; see Chiesa, 1994) natural–science–style *x leads to y* (or *x is followed by y*) type of mechanical causality. But psychologists cannot easily relate a given input to a given output as cause. So psychologists presume something must happen to the inputs before outputs occur. Somewhere and somehow the inputs must be changed, *transformed,* into outputs. Those changes, as they do not seem apparent elsewhere, must be happening inside the organism, possibly because of something the organism can be seen as doing. Psychologists try to relate the inputs and outputs to learn something about what they presume is behind them. Psychologists then undertake to tell the world, from their various perspectives, all the things they assume are happening inside the organism, perhaps *because* of the organism. In placing their interests inside the organism, they keep to their familiar mechanical causality. Now, however, this causality takes the form of *x leads to* O *leads to y.* Here, O (for organism) represents the various *transformations* different psychologists believe occur inside the organism as inputs are then said to *become* outputs. However, the transformation paradigm does not address

the makeup of transformations; it addresses only their position between the inputs and outputs. Psychologists hypothesize, from various perspectives, numerous types of transformations and these can be contradictory and even mutually exclusive. The result is the interplay between the transformation paradigm and eclecticism. The paradigm supports transformations in general, whether agreeable or contradictory, while under eclecticism the latter are automatically tolerated.

Even though the many, specific psychological approaches differ among themselves, they all adhere to the transformation paradigm. Giving them a label like "school" does not change this characteristic. None of them adheres to the selection paradigm. At this level of analysis, only the natural science of behavior founded by Skinner adheres to that paradigm (but see Ulman, 1991, also). And the selection paradigm is as different from the transformation paradigm as evolution is from creationism.

## The Skinnerian Alternative

Skinner was doing research in the 1930s using the selection paradigm; but he was operating *within a unit of organized psychology.* The location of this research may simply be a product of what evolutionary biologists call historical contingency (see Gould, 1989) since Skinner could, and under Crozier's influence almost did, pursue his work *officially* from within a unit of organized biology. Yet the venue of this research constitutes the beginning of an historical trunk, shared by both behaviorology and psychology. This trunk lasted only for about three decades and has since divided, forming two distinct branches, each with its own continuing disciplinary history.

The roots of this trunk are also as different as the two paradigms and disciplines that shared the trunk before diverging. The history of these roots traces back, in Western culture, to various early Greeks and their philosophies and approaches, and the ideologies of those and other times. As Lerner (1991) reports, the early Western versions of "The empirical and the deductive methods… both arose around 500 B.C. They emerged from a fierce social conflict to determine what sort of society would succeed Bronze Age civilization—a society of free labor or one of slave labor" (p. 62).

The characteristics of the selection paradigm and behaviorology have their Western roots in the preferences of the Ionian Greeks (e.g., Thales, circa 550 B.C.E., and Anaxagoras, circa 450 B.C.E.). With navigation and other needs prompting developments in science and technology, the Ionians preferred the empirical method, its associated philosophical approach known as materialism (which takes matter, nature, as primary, that is, reality exists whether or not people are around to think about it), and the inductive (observation– and measurement– and action–based) approach to knowing. These Ionian roots are found to be ascendant or prevalent in societies during periods of increasing social progress, for example, during the time of the Ionian trading cities when "new societies of traders, craftsmen, and freeholding peasants—the first limited attempts at democracies and republics" (Lerner, 1991, p. 63) were forming, as well as during the Renaissance and the nineteenth century (Lerner, 1991, p. 419) and to some extent the present (e.g., in Japan around the 1980s).

In contrast, the characteristics of the transformation paradigm and psychology have their Western roots in the preferences of the dualist Greeks (e.g., Plato, circa 350 B.C.E., and Aristotle, circa 325 B.C.E.). The dualist Greeks preferred the deductive method, its associated philosophical approach known as idealism (which takes ideas, thoughts, as primary, that is, reality does not exist apart from what people think exists), and the hypothetical–deductive (pure reason and less observation) approach to knowing. These dualist roots are found to be ascendant or prevalent in societies during periods of decreasing social progress, for example, during Greek slave–holding society, during the Western middle ages, and in many ways during much of the 1900s (see Sagan, 1995).

Both these roots and their differences have some impact on most disciplines. The branching of the psychology–behaviorology shared historical trunk is not an isolated instance in academic history. It may be part of an ongoing scientific revolution. For example, in his 1991 book *The Big Bang Never Happened*, Eric Lerner argues that these roots and differences are the basis of the competition between big bang cosmology and plasma cosmology. He argues that big bang proponents continue in the Plato–Aristotle tradition, and that observational evidence seems to show their position to be less parsimonious than their competitor's position. Plasma proponents, he argues, continue in the Ionian tradition, and their position seems to be more consistent with observations. Some parallels with psychology and behaviorology, and their paradigm clash, are evident. Even so, whether or not a Big Bang happened is irrelevant to any clash between psychology and behaviorology, and in any case is still unresolved.

Sometimes in paradigm clashes, one position ultimately eclipses or subsumes the other, as when quantum mechanics superseded Newtonian mechanics in physics. The positions co–exist for a time as one develops and advances while the other declines. With other paradigm clashes, such as the one between behaviorology and psychology, the positions co–exist for a time, sharing their history. Then they branch off, going their separate disciplinary ways.

Figure 1 illustrates the shared history, its roots, and its later branching for behaviorology and psychology:
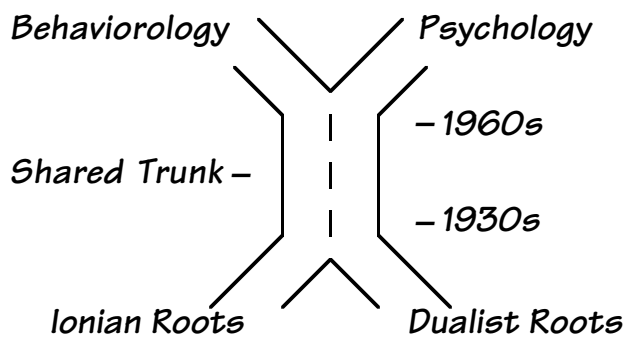
**Figure 1.** Branching disciplinary tree and philosophical roots.

Different kinds of reasons bring about those different paradigm–clash scenarios. Regarding behaviorology and psychology, how could the shared historical trunk come about? How was Skinner's beginning behaviorological science from within psychology possible, given the incommensurable differences between the paradigms?

Skinner's doing such work from within psychology was possible because the psychology of the time was much more sensitive to differences at the level of schools and approaches than to differences between paradigms. Various schools of thought were already contending within psychology. All these shared the transformation paradigm. But no school was able to demonstrate itself to be better than the other schools nor could they show that other schools were inadequate. So they all had to tolerate each other and co–exist, which they did under the rationale of eclecticism. When Skinner originated the operant approach, it also could not be shown to be inadequate and so it also was tolerated. The fact that the operant approach did not share the transformation paradigm with the psychological schools but was based in the selection paradigm did not originally occasion much comment.

By the 1960s, however, circumstances had changed. Those who continued to advance the science and technology Skinner had originated had come to be known first as operant behaviorists and then as behavior analysts or *radical behaviorists.* (The latter was more concise since usage of the other names had become blurred over time; now, *behaviorologists* is the best descriptor, at least for those who are part of the behaviorology movement.) By using the criterion of e*ffectiveness in action regarding subject matter,* radical behaviorists were demonstrating the value of their science. That same evidence was also showing the various psychological approaches to be less effective and unparsimonious. Yet parsimony receives scant attention in psychology, and *effective action regarding subject matter* was then—and still among psychological approaches to-

day is—but a minor criterion for adopting explanations (see Fraley & Ledoux, 2002, Ch. 5). As a result, the stage was set for various substantial changes in the positions of both psychologists and radical behaviorists. The effects of incommensurable paradigms were driving both the overt paradigmatic differentiation and the subsequent historical separation into officially independent disciplines.

### The Reaction for a
### Non–Natural Science Tradition

Also during the 1960s, psychology was undergoing the "cognitive revolution" (or, depending on one's perspective, "cognitive counterrevolution"). One aspect of that development was psychologists' increased acceptance that they had little interest in behavior for its own sake or in demonstrations of effective control. So they could not convince themselves of much need to heed the concerns of radical behaviorists. But they were not unmoved by those concerns. They were paying more and more attention to the paradigmatic similarity among the various psychological approaches and less attention to their eclectic differences. They began to apprehend the role of their paradigm in emphasizing their similarities without threatening their differences. As a consequence they began to disassociate from any group that did not share their transformation paradigm. This especially meant disassociation with *radical* behaviorism since several other forms of behaviorism do operate under the transformation paradigm (including interbehaviorism, methodological behaviorism, paradigmatic behaviorism, and Watson's original behaviorism).

Radical behaviorists, after decades of a history shared with psychology, experienced the disassociation as the effects of the incommensurability of the respective paradigms. Before the cognitive movement, psychology had tolerated and benefited from radical behaviorism. However, since the cognitive movement began, psychologists have labeled and treated as dead any non–transformational positions regardless of the facts (see Wyatt, Hawkins, & Davis, 1986). Radical behaviorism was a common target of such unjustifiable slurs because its paradigm was fully incommensurable. Consequently the demonstrated quality and quantity of its research and applications were given less and less consideration. Accumulated scientific evidence for its more parsimonious and practical accounts of behavior no longer received the attention their effectiveness had earned. Instead, political and economic concerns prevailed, with programmatic emphases, funds, and other resources being more emphatically directed towards hypothetical cognitive transformations. The result of these developments was the objective, though not necessarily immediately recognized, differentiation of the transfor-

mation and selection paradigms. And this differentiation provided the foundation for the separation of the independent disciplines of psychology and behaviorology.

Also, psychology is not entirely consistent in these matters. It continues to claim *that behaviorism is dead.* However, this is only true within psychology and only in the sense that psychology all but ignores transformational behaviorisms while the work of radical behaviorists is no longer advancing in psychology (although this work does continue to advance in behaviorology and in the efforts of behaviorological scientists who remain employed in units of organized psychology). Yet psychology also claims *that behaviorism still is part of psychology.* This also is only partly true in that various transformational *behaviorisms* continue to exist within psychology. Also, the principles and practices of the first few decades of radical behaviorist research did occur mostly in units of organized psychology and so are a part of that historical time shared with psychology. Introductory psychology textbooks still faithfully report, usually as part of the chapter on learning, this outdated material, and little beyond it. While over thirty years out of date, that material is presented as though it were the latest material available, which it generally is— *in psychology.* However, the years of advances since the paradigm differentiation of the 1960s are arguably not part of psychology and are rarely covered in those textbooks (with rare exceptions such as the text by Poling, Schlinger, Starin, and Blakely, 1990). Again, the advances were generally reported in journals (beginning, for example, with the *Journal of the Experimental Analysis of Behavior*) that, being independent of psychology's principal disciplinary literature, are seldom perused by most psychology textbook authors. The benefits from those advances accrue mostly according to the extent to which one has acquired and maintains a verbal and skill repertoire in behaviorology or, at least, in behaviorological science.

***The experience in China.*** The situation of behavior science in the People's Republic of China provides corroborative evidence for the separateness and independence of behaviorology and psychology. Chinese behavior science professionals in Xi'an, Shaanxi, provided commentary on the situation in China to the author while he was there, as part of a faculty exchange, teaching courses on Verbal Behavior, and Behaviorology and Education, during the 1990–1991 academic year.

The discussions uncovered several points of mutual interest. The Chinese use a word they translate as *psychology* to encompass the three sources they currently see for their discipline: traditional Chinese views on why people do what they do, the views adopted from the discipline in the Soviet Union (especially the work originating with Pavlov on reflex/emotional, that is, respondent, behavior), and Western perspectives. The Chinese have included three parts in the Western component of their

discipline: psychoanalytic (i.e., Freud), cognitive/mentalistic (e.g., Maslow and Piaget), and behavioral (i.e., the science of behavior originated by Skinner).

The Chinese report a special preference for the Pavlovian and Skinnerian work based on the natural science approach and experimental methods these two share. In part, this preference for Pavlov and Skinner may be due to a particular aspect of Chinese history. The Chinese culture has been less burdened than Western culture has been by philosophically idealist dualism, a dualism that pervades Western culture. So Chinese culture has suffered less from the unscientific separation of phenomena into the different realms of mental and physical (soul/body, spiritual/material, mind/reality) that results from philosophical dualism. Western psychology traditionally prefers the non–physical aspect. (The Chinese language, while it has a rich variety of terms for most of the Western usages of the term *mind,* actually lacks a direct translation of mind as Western psychologists use that term—as a dualistic, uncaused metaphysical cause. Instead, for that usage, Chinese professionals generally use a word that, less appropriately, translates back into English better as "brain.")

However, in the 1950s, Chinese behavior science professionals lost contact with Western developments. They spent the decade of the 1980s trying to update, and thought the update complete. But they were disturbed by what they saw as very few advances in principles and practices, from those missing years, relevant to solving practical, behavior–related problems.

In beginning to look elsewhere for solutions, they are discovering that their update is not complete. It involved little beyond the traditional Western psychology sources (literature, texts, personnel) and these contain little of the substantial behaviorological–science advances from those years. The Chinese are discovering that they have overlooked virtually all the post–1950s advances in principles and practices in the science originally founded by B.F. Skinner. This occurred because at about the same time that the Chinese lost contact, the greatest proportion of those advances began to be, and have since been, increasingly reported and supported *outside* psychology, greatly reducing access to them from within psychology. The Chinese are also considering the possible reasons for this situation, including the incommensurable paradigm differences indicating and validating separate disciplines. (See Ledoux, 2002c, for a more complete discussion of behaviorology in China.)

***Transformations and eclecticism revisited.*** Are hypothesized, internal transformations a reasonable alternative to behavior–environment interactions? The variety of psychology's transformations may indeed be more initially captivating than the patient discovery and tested application of complex behavioral laws. Transformations

seem smoothly consistent with the philosophically dualist cultural history that pervades the milieu of Western society. Are these a rationale for the many people attracted to psychological theorizing? This attraction occurs in spite of the much greater difficulty in later making use of theorized transformations to help solve society's various general and personal problems, compared to the more technological applications of behavioral laws to such concerns. Is this another example of being affected more by short–term variables (e.g., the fun of discussing competing transformational accounts) than by delayed variables (e.g., the later, improved effectiveness, in helping situations, after having studied behavior–environment interactions)?

In any case, some of these transformations are simply mentalistic inventions that violate a basic premise of the natural sciences, namely respect for the continuity of events in space and time that accumulates, link by related link, in a researchable natural history. Hence the scientific status of those transformations is questionable and unparsimonious. The transformation paradigm allows and invites such untestable, metaphysical inventions to enter the chain of space–time events, breaking and thereby disrespecting the continuity of those events. Such transformations, their related paradigm, and disciplines or parts of disciplines supporting that paradigm have thus removed themselves from consideration as part of any *natural science* discipline or field.

Many other transformations are not transformations at all but rather are the physiological bases of behavior, an appropriate subject matter for a natural science such as physiology. For example, neurons firing (in the central or peripheral nervous systems), in ways often but not necessarily connected to muscles contracting or glands secreting, etc., are physiological aspects of the same fact whose behaviorological aspects observers might witness as, say, salivating or the movements of a hand or of the vocal cords under particular conditions and with particular consequences.

Sometimes the physiological and behaviorological aspects cannot be separated, such as when the behavior is covert. Muscles or glands may not even be involved. For example, due to having learned to observe and verbally report the occurrence of private responses (Skinner, 1953, Ch. 17), people may observe and report themselves seeing something, regardless of whether the thing seen is present to be seen or not; yet all that the properly instrumented physiologist observes about this *seeing* is neurons firing at the back of the brain. These neurons firing (physiological level) and the behavior of seeing (behaviorological level) are inseparable aspects of the same fact, the same phenomenon. Neither overt nor covert behavior can occur without nervous system activity; but the nervous system activity aspect may sometimes occur only along with a covert be-

havior aspect. Exactly what is happening physiologically when behavior (overt or covert) occurs and when related variables occur (the particular conditions and particular consequences) are important questions to which the natural science discipline of *physiology* can provide answers.

Is psychology's crossover to physiology an appropriate one? Psychologists who take this route show some preference for natural science, physiology in this case. However, psychologists may be the only ones viewing the crossover as a reasonable disciplinary activity. For the crossover interrupts physiology's mission and further compromises the status of psychologists' own discipline by shifting their subject matter into areas legitimately claimed already by a different discipline. Psychologists may find academic turf battles with physiology far more common than with behaviorology.

As for eclecticism, observers can already note a decrease in its importance even in psychology. The shift in emphasis under the cognitive movement to stressing similarities (e.g., the transformation paradigm) seems to have prompted the decrease in eclecticism which is evident in the relative coverage of the psychological perspectives. Perusal of various psychology film series (e.g., the *Discovering Psychology* series) and any number of introductory psychology textbooks shows the cognitive perspective to be filling the stage. Next in coverage is information derived from another discipline, physiology. Other perspectives (e.g., psychoanalytic, humanistic, or gestalt) often receive little more than lip service. Unfortunately, this waning of eclecticism has not paralleled any commitment for changing toward an effective science concerned with why people do what they do and what can be done about it. (The Poling, *et al.,* 1990, text is one exception in that it provides some natural science standards with which to compare and evaluate the several alternative perspectives it includes at appropriate points.)

### The Historical Division

Psychology's increasing stress on similarities like the transformation paradigm had contributed substantially to the differentiation of the established disciplinary paradigms. That *differentiation,* in the 1960s, objectively created two separate and independent disciplines out of the previous shared history. The historical trunk divided into separate branches. These disciplines differ not only in paradigms but also, in associated ways, in subject matters, philosophies, methodologies, etc. Not until the 1980s, though, did the resulting changes in contingencies (the effects of incommensurability) begin affecting people enough for them to emit behavior consistent with the fact of different disciplines. Not until the 1980s did they begin to name and reorganize behaviorology.

## How is Behaviorology Related to Other Disciplines and Fields?

The distinction between *social science* and *natural science* is relevant here because the interest behaviorologists have in people is taken by some professionals as placing behaviorology in the social science arena. However, social sciences not only derive from an interest in people (an interest shared by many natural sciences), but from another commonly acknowledged characteristic as well; social scientists easily reach contradictory conclusions after following the same scientific procedures. This is partly because many social scientists allow metaphysical (mystical) events to enter their explanatory accounts. In contrast, natural scientists more easily reach consistent conclusions after following the same scientific procedures. This is partly because natural scientists disallow the inclusion of metaphysical events in their explanatory accounts, for such events are untestable. Natural sciences respect the continuity of events in space and time that accumulate in a researchable natural history. These are defining characteristics of natural science which behaviorology shares. (A later, more refined view has natural science opposing mysticism directly rather than by way of social science. See Ledoux, 2002f or 2002g, for details and references.)

Among the natural sciences, behaviorology is one of the foundation life sciences (along with biology) rather than one of the foundation physical sciences (such as physics or chemistry). Figure 2 illustrates behaviorology's position along a life science continuum (see Fraley & Ledoux, 2002, about the term *culturology*).
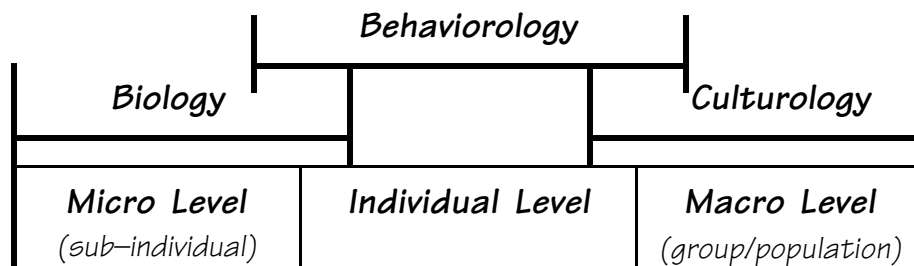


**Figure 2.** Disciplinary coverage for the three main levels of analysis in the life sciences.

(The study of ecosystems, species evolution, and the behavior of animals in groups by some animal biologists implies that a disciplinary overlap also exists between biology and culturology. So Figure 2 might be redrawn as a triangle with extended sides that cross each other. Each side would represent one of these domains and its associated discipline. The areas where the lines cross would then represent the overlap in the interests of the intersecting disciplines.)

As a basic science, behaviorology provides the foundations that inform the considerations and technologies of various applied behavioral fields (e.g., organizational behavior management) as they seek to fulfill their respective cultural missions (a *field* is where one applies a foundation science *discipline*). Such fields range from advertising to zoology, with many currently in a scientific limbo without an appropriate basic science informing their efforts. Fraley (1987), in a paper addressing the cultural mission of behaviorology, stresses the role of behaviorology as the appropriate science to inform these areas (also see Fraley & Ledoux, 2002).

## How Much is Encompassed by Behaviorology, Such as its Contributions?

Plenty, but thorough coverage goes beyond the bounds of this paper. The point of this paper was to introduce an analyzed history of the emergence of the discipline of behaviorology through the behaviorology movement. In the process the status and mission of behaviorology were introduced as well. One must still address the basic and advanced natural laws involving behavior as discovered by behaviorological scientists as well as behaviorology's philosophy of science, interpretations, and analyses, plus its technologies and applications. All of these constitute parts of behaviorology's past, current, and potential cultural contributions.

For instance, here are some basic components of the radical behaviorist philosophy of science; these components have value beyond the boundaries of behaviorology itself, and some have been mentioned already: (a) Radical behaviorists respect behavior as a *natural* phenomenon as

part of respecting the continuity of events in space and time which accumulates as a natural history. (b) Radical behaviorists emphasize experimental control over dependent variables and the application of that control in culturally beneficial ways. (c) Radical behaviorists recognize private events, such as thinking or emotions, as covert behaviors involved in the same lawful relationships that involve overt behavior. (d) Radical behaviorists acknowledge that scientists are also behaving organisms whose behavior, scientific or not, is affected by the same variables that affect other behavior, and that those variables include scientists' philosophy of science. (See Ledoux, 2002a, for some elaboration; see Chiesa, 1994, for extensive discussion.)

The laws involving behavior essentially reflect the functional relations between behavior and the variables inherent in an organism's (a) species history, (b) personal history, (c) current situation and, for people, (d) cultural setting. These contain the variables a behaviorologist addresses when trying to analyze, understand, predict, control, and interpret the behavior of organisms. A peek at some of the advances in researching and applying these laws (advances arising since the paradigm differentiation in the 1960s) would involve describing numerous topics: (a) the distinction between event–shaped and verbally–mediated behavior (Vargas, 1988), (b) the analysis of verbal behavior (Skinner, 1957), (c) the recombination of repertoires (Epstein, 1981), (d) establishing operations (Michael, 1982), (e) multi–term (n–term) contingencies (Sidman, 1986a, 1986b), (f) the function–altering effects of contingency–specifying stimuli (Schlinger & Blakely, 1987), (g) stimulus equivalence relations (Sidman, 1994; Stromer, 1991), (h) the general level of reinforcement (Cautela, 1994), and (i) behavioral engineering and cultural design (Skinner, 1971; Ulman, 1991; West & Hamerlynck, 1992). These topics highlight some of the state–of–the–art aspects, in the 1990s, of the scientific comprehension and handling of complex human behavioral relations.

Other cultural contributions involve continuously developing and extensively tested behavioral engineering technologies applicable to all facets of life, with particular value in resolving both personal and cultural concerns. These range from preventative measures in child–rearing practices, to making education effective (e.g., Johnson & Layng, 1992) including the critique of developmentalism, to enhancing business, industrial, and organizational management, to the design and redesign of cultures and cultural practices including those related to rescuing the planetary environment and so helping restore the mutually beneficial balance between the Earth and its inhabitants (see Gore, 1993; also see the bibliography at the end of Ledoux, 2002e, for references to other examples, as well as to works covering more of the depth and range of the behaviorology discipline and its cultural utility). Either a general–behaviorology textbook (e.g., Fraley, 2004) or issues of the *Journal of Applied Behavior Analysis* can provide a starting point for reviewing the research on many of these applications.

## Why Should Anyone Learn Anything About Behaviorology?

The laws of behavior (that is, the relations described by those laws) do not always produce benefits; at least as often as not, they may produce problems. For instance, many families fall victim to the accidental, unplanned conditioning of various undesired behaviors. Without contact with behaviorological science, parents may never realize that yelling at or even spanking a child may actually strengthen the behavior they are trying to weaken, especially if that is the only or main kind of attention the child receives. Parents may never realize that the general rule to provide appropriate kinds of attention more when children are behaving in the ways parents desire (i.e., to "catch your children being good"; Christophersen, 1988) is both more effective than just ignoring them, and more effective than just catching and punishing them when they are bad. "Catching them being good" is more effective in increasing desired behavior and thereby reducing the occasions for undesired behavior. (See Latham, 1994, for details on this and other behaviorologically based, prevention oriented child–rearing practices.)

As that example shows, the accidental or unplanned operation of behavioral laws having undesirable effects on behavior becomes a tyrant affecting people's lives. Until after behaviorological research began in the 1930s, few could do much to stop that tyranny for those laws were little understood. Today, through behaviorology, people can increasingly replace that tyranny by designing and redesigning the world in which they live. They can take the responsibility to use the ongoing discoveries about those laws to improve the human condition (and even to evaluate scientifically what words like "improve" mean; see Krapfl & Vargas, 1977; Vargas, 1975, 1982). These actions are possible because one of the behaviors generated and maintained by the operation of these laws is the behavior of people in general taking control of themselves, and the environmental variables that affect them, in informed ways (which also enables them to countercontrol for potential misuses of this science). The greatest initial significance of behaviorology may not be in the management of day–to–day individual affairs nor, perhaps, even in providing solutions to large social problems (e.g., the crisis in American education). Instead the greatest significance may be in providing some critically needed tools to help understand and deal with the world–wide environmental and outer space concerns and crises facing the generations of today and tomorrow.

The basic reason to study behaviorology, then, is to reduce the risks and derive more than the minimal, automatic benefits from the way nature's laws govern behavior. Studying behaviorology expands your repertoire of behavior with respect to those laws and their applications. The more extensive your training in behaviorology is, the greater can be your effectiveness, your success, with its applications to human concerns.

How much behaviorological knowledge and skills is right for you? Everyone should be as familiar with the basics of behaviorology as they are with the basics of biology and physics and other standard natural sciences covered through primary and secondary education. Beyond the basics, "How much is right?" depends on the complexity of the applications appropriate to your areas of concern. The more complex the applications are in a particular area, the greater is the amount of behaviorology study needed if you are to be effective in that area. For instance, look at some of the areas involving children, for these are typical of the complexity levels of most areas of human concern. While a lack of study leaves anyone's potential for success to accident or chance, parents can, by design, attain a quite reasonable level of informed effectiveness in child–rearing practices with only a basic amount of behaviorology study (the equivalent of one or two courses in behaviorology; see Ledoux, 2002b). Educators, on the other hand, find that teaching effectively requires substantially more study. And working with autistic children requires even more. In each of the two latter cases, the complexity of both the applications and the relevant controlling variables increases (while gaining access to those variables is often more difficult as well). Such circumstances demand a more professional level of training (starting with a Bachelor's degree in behaviorology) if practitioners are to be as effective as possible in areas such as these.

## A Matter of Epistemology Also

The "Why study behaviorology?" question need not be answered only with respect to complexity and effectiveness. Consider also this answer: "We should study behaviorology because we are affected by nature's laws anyway; perhaps the more we know concerning these laws, the better off we will be." But what does "know" mean? Let us take a little trek into a scientific *epistemology* (the question of what *knowing* is) to help understand this answer better, including how it relates to the complexity and effectiveness answer.

Nature's laws, the laws of the universe, affect us at different *levels of knowledge.* They affect us (a) whether we like it this way or not, (b) whether we have used those laws or not, (c) whether we "know *about*" those laws or not (as in "can use the laws effectively," that is, whether our use–skills have come effectively under the control of

those laws or not), and (d) whether we "know" those laws or not (as in "can state and use them," that is, whether our talk, or better, our talk and our use–skills, have both come effectively and explicitly under the control of *statements* of the relationships inherent in those laws or not). In these levels, *knowledge* refers to the range and depth of our behavior repertoires. To illustrate these levels of knowledge (repertoire), consider an example from the teaching profession.

Persons untrained in chemistry but trained in English literature (and even trained in teaching literature as well) would be quite out of place conducting a chemistry class. They do not know the names or properties of the chemicals under discussion in that class (i.e., their behavior repertoire does not include responses appropriate to the pertinent variables, such as the discriminative stimuli and consequences, present in that situation). Yet if they mix some of the chemicals before them, they will produce the same chemical reactions that their trained chemistry colleagues would have produced had those colleagues mixed those same chemicals. The laws of chemistry are in force whether they like it or not, *and* whether they use them (by mixing some of the chemicals before them) or not.

What about the trained chemistry colleagues? Are they trained only in chemistry or are they also trained in teaching, and does that make any difference, especially to teaching? After accumulating, usually over years, certain kinds of experiences (which typically occur by accident or chance), the chemistry teachers who are trained only in chemistry come to *know about* teaching. At least, you would say they do so to the extent that they come to be effective in teaching, that is, in expanding the chemistry–related repertoires of their students. Their teaching–related use–skills have come effectively under the control of the laws involved in successful teaching. Yet even after decades of teaching, they are unlikely to be able to describe, in terms of nature's complex laws relating to the expansion of repertoires (i.e., the scientific foundations of teaching and learning), the reasons for their effectiveness. They cannot tell another *chemistry–trained* person how to *teach* chemistry effectively. (They can, of course, make up theories about their successes; but that is a different matter entirely, and something to be avoided if teaching in general is to become effective.) While they can effectively teach chemistry, and can model doing so, they cannot effectively *teach* teaching, even of chemistry. They do not *know* teaching as they know chemistry.

Effectively expanding the repertoires of students through knowing teaching (an instructional design repertoire), and effectively handling chemicals (a subject–matter repertoire), are very different behavior repertoires. The latter is informed by chemistry while the former is informed by behaviorology. If the would–be teachers of chemistry or any subject matter want to become effective

teachers, want to know teaching, want a comprehensive repertoire of teaching skills, and want it by design in a shorter time rather than by chance over a longer time, then they must study the discipline that informs teaching. To the extent that they learn both to teach a particular subject matter (i.e., to expand their students' repertoires in that subject matter) and to explain accurately and scientifically what it is that they are doing which results in that expansion of repertoires, to that extent you would say not only that they *know* their subject matter but also that they *know* teaching as well. Their talk and use–skills have both come effectively and explicitly under the control of *statements* of the relationships described by the laws of behavior relevant to teaching. (You might even say they *know* teaching even if only their *talk* has clearly come under that control.) And teaching is but one example of the many human endeavors where levels of knowledge/repertoire relate to effectiveness.

Vargas and Fraley (1976; also see Vargas, 1996) discuss some benefits of separating these two major repertoires in education, the repertoires of subject–matter expertise and instructional design expertise. These repertoires might be too complex to expect most individuals to expend the effort to master both thoroughly. However, two experts, each with mastery of one of these repertoires, can combine their efforts and thereby achieve greater overall educational effectiveness. Indeed, one design expert can combine efforts with a dozen or more content experts to achieve such improvements. The subject–matter experts can concentrate on the subject–matter content of the courses or programs of study while the instructional design expert concentrates on the instructional arrangements to teach those contents with scientifically sound methods.

The point Vargas and Fraley make is significant because the usual emphasis on subject–matter expertise generally leads to ignoring the complementary need for instructional design expertise. People presume, incorrectly, that someone who is a subject–matter expert automatically has a thorough enough repertoire appropriate for *teaching* that subject. Yet usually the teaching repertoire is minimal. That is especially common in post–secondary education. However, as our example with teaching chemistry showed, *early* and long–sustained effectiveness requires training in both expert repertoires. Vargas and Fraley refocus attention on the need for employing a scientifically based instructional design repertoire if educational effectiveness is to improve. The question is, will effectiveness arise by chance in the slow, lucky accumulation of the necessary experiences, or will it accrue by design through training and practice, especially in the so–far neglected arena of instructional design? Vargas and Vargas (1992) extend the discussion to current instructional materials and programming.

Our trek into epistemology helps put into perspective the differences between *just being affected* by nature's laws (whether we like them or not, *or* use them or not), *knowing about* them, and *knowing* them, as these relate to increasing complexity requiring more comprehensive study for effectiveness. This applies especially to behaviorology, as the science of behavior relations, since so many areas of interest involve human behavior. The more extensive your training in behaviorology, the more effective you can be in dealing with behavior in the contexts of concern to you. (For reasons of this sort, TIBA included among its purposes support for a basic "behavior literacy" graduation requirement of appropriate content and depth at all levels of education; at the college level, that would likely involve a couple of courses. See Fraley & Ledoux, 2002, and Ledoux, 2002b, 2002f.)

### A Matter of Hygiene Also

Yet another answer to the "Why study behaviorology?" question is available. With so many human problems (and potential threats to survival itself), the importance of learning and applying behaviorology today is akin to the importance of learning and applying the then new discoveries of biological science about 150 years ago. The discovery of the relation between micro–organisms and disease formed the basis, in the first half of the 1800s, of today's standards for biological hygiene. (Biological hygiene is that vital ounce–of–prevention whose success, in reducing the frequency of disease, we take for granted today, so many years after the discovery of the relevant scientific facts.)

Learning and applying behaviorology could be called a matter of *behavioral hygiene,* the next step, especially in problem prevention, after having successfully developed and adopted biological hygiene. We would not consider risking hepatitis by eating without first cleaning our hands after using the toilet. Why should we then continue to risk, for example, low success rates (relative to potential) in education when we can, *if appropriately trained,* bring about consistently demonstrated high success rates in both deportment/emotional and academic/intellectual areas? (For elaboration, see Johnson & Layng, 1992; Latham, 1997; Skinner, 1968; and West & Hamerlynck, 1992.) Why should we take those risks when we can, instead, clean up our *actions* by applying some behavioral hygiene? How many years will pass before we achieve *today's* potential successes and take behavioral hygiene for granted? The sooner we become more informed by this science, throughout society, the less time it will take.

Let us take the responsibility to learn and apply behaviorology's discoveries about the laws of behavior at least for the sake of behavioral hygiene. Let us do so to improve the human condition, to take control of our interactions with our environments, and to master control of ourselves.❧

## Endnotes

From the original address prepared for Chinese and other audiences, this paper was revised for publication (1992) in *Behaviorological Commentaries, Serial No. 3*, pp. 11–31. Subsequently, it was the first—and principal—part of a presentation at the second Behavior Analysis Around the World Conference, held in 1992 at Keio University in Tokyo, Japan (the other part of that presentation coming from Ledoux, 2002c). With further minor revisions, it appeared in *Origins and Components of Behaviorology* (Ledoux, 2002e, pp. 3–24) under a longer title ("An introduction to the orgins, status, and mission of behaviorology: An established science with developed applications and a new name"). In any case this paper presents only a starting point for further, more in–depth examinations of behaviorology to be found in other behaviorological–science resources (such as Fraley & Ledoux, 2002).

The author thanks those Chinese and Western colleagues, especially Shi Ming de, Guy Bruce, John Eshleman, and Lawrence Fraley, who provided many helpful comments on various drafts of this material. Address correspondence regarding this paper to the author at SUNY–CTC, Canton NY 13617–1096 USA.

## References

Cautela, J.R. (1994). General level of reinforcement II: Further elaborations. *Behaviorology, 2* (1), 1–16.

Chiesa, M. (1994). *Radical Behaviorism: The Philosophy and the Science.* Boston, MA: Authors Cooperative.

Christophersen, E.R. (1988). *Little People, (Third Edition).* Kansas City, MO: Westport Publishers.

Epstein, R. (1981). Of pigeons and people: A preliminary look at the Columban simulation project. *The Behavior Analyst, 4,* 43–55.

Fraley, L.E. (1987). The cultural mission of behaviorology. *The Behavior Analyst, 10,* 123–128.

Fraley, L.E. (2004). *General Behaviorology: The Natural Science of Human Behavior.* Morgantown, WV: Lawrence E. Fraley (Rt. 1 Box 233A, Reedsville WV 26547 USA).

Fraley, L.E. & Ledoux, S.F. (2002). Origins, status, and mission of behaviorology. In S.F. Ledoux. *Origins and Components of Behaviorology—Second Edition* (pp. 33–169 [seven chapters]). Canton, NY: ABCs.

Gore, A. (1993). *Earth in the Balance.* New York: Plume.

Gould, S.J. (1989). *Wonderful Life.* New York: W.W. Norton.

Johnson, K.R. & Layng, T.V.J. (1992). Breaking the structuralist barrier: Literacy and numeracy with fluency. *American Psychologist, 47* (11), 1475–1490.

Krapfl, J.E. & Vargas, E.A. (Eds.). (1977). *Behaviorism and Ethics.* Kalamazoo, MI: Behaviordelia.

Latham, G.I. (1994). *The Power of Positive Parenting.* Logan, UT: P&T ink.

Latham, G.I. (1997). *Behind the Schoolhouse Door: Eight Skills Every Teacher Should Have.* Logan, UT: P&T ink.

Ledoux, S.F. (2002a). An introduction to the philosophy called radical behaviorism. In S.F. Ledoux. *Origins and Components of Behaviorology—Second Edition* (pp. 25–32). Canton, NY: ABCs.

Ledoux, S.F. (2002b). Behaviorology curricula in higher education. In S.F. Ledoux. *Origins and Components of Behaviorology—Second Edition* (pp. 173–186). Canton, NY: ABCs.

Ledoux, S.F. (2002c). Behaviorology in China: A status report. In S.F. Ledoux. *Origins and Components of Behaviorology—Second Edition* (pp. 187–198). Canton, NY: ABCs.

Ledoux, S.F. (2002d). Increasing tact control and student comprehension through such new postcedent terms as added and subtracted reinforcers and punishers. In S.F. Ledoux. *Origins and Components of Behaviorology—Second Edition* (pp. 199–204). Canton, NY: ABCs.

Ledoux, S.F. (2002e). *Origins and Components of Behaviorology—Second Edition.* Canton, NY: ABCs.

Ledoux, S.F. (2002f). Afterword. In S.F. Ledoux. *Origins and Components of Behaviorology—Second Edition* (pp. 337–358). Canton, NY: ABCs.

Ledoux, S.F. (2002g). Defining Natural Sciences. *Behaviorology Today, 5* (1), 34–36.

Lerner, E.J. (1991). *The Big Bang Never Happened.* New York: Times Books.

Lett, J. (1987). *The Human Enterprise: A Critical Introduction to Anthropological Theory.* Boulder, CO: Westview Press.

Michael, J.L. (1982). Distinguishing between discriminative and motivational functions of stimuli. *Journal of the Experimental Analysis of Behavior, 37,* 149–155.

Poling, A., Schlinger, H., Starin, S., & Blakely, E. (1990). *Psychology: A Behavioral Overview.* New York: Plenum.

Sagan, C. (1995). *The Demon–Haunted World: Science as a Candle in the Dark.* New York: Random House.

Schlinger, H. & Blakely, E. (1987). Function–altering effects of contingency–specifying stimuli. *The Behavior Analyst, 10,* 41–45.

Sidman, M. (1986a). Functional analysis of emergent verbal classes. In T. Thompson & M. Zeiler (Eds.). *Analysis and Integration of Behavioral Units* (pp. 213–245). Hillsdale, NJ: Erlbaum.

Sidman, M. (1986b). The measurement of behavioral development. In N.A. Krasnegor, D.B. Gray, & T. Thompson (Eds.). *Developmental Behavioral Pharmacology* (pp. 43–52). Hillsdale, NJ: Erlbaum.

Sidman, M. (1994). *Equivalence Relations and Behavior: A Research Story.* Boston, MA: Authors Cooperative.

Skinner, B.F. (1953). *Science and Human Behavior.* New York: Macmillan.

Skinner, B.F. (1957). *Verbal Behavior.* New York: Appleton–Century–Crofts. Reprinted, 1992, Cambridge, MA: The B.F. Skinner Foundation.

Skinner, B.F. (1971). *Beyond Freedom and Dignity.* New York: Knopf.

Skinner, B.F. (1968). *The Technology of Teaching.* New York: Appleton–Century–Crofts.

Skinner, B.F. (1979). *The Shaping of a Behaviorist.* New York: Knopf.

Stromer, R. (1991). Stimulus equivalence: Implications for teaching. In W. Ishaq (Ed.). *Human Behavior in Today's World* (pp. 109–122). New York: Praeger.

Ulman, J.D. (1991). Toward a synthesis of Marx and Skinner. *Behavior and Social Issues, 1* (1), 57–70.

Ulman, J.D. (1992). Behaviorology and psychology are incommensurable paradigms: A rejoinder to Staats. *Behaviorological Commentaries, Serial No. 2,* 23–28.

Vargas, E.A. (1975). Rights: A behavioristic analysis. *Behaviorism, 3* (2), 120–128.

Vargas, E.A. (1982). Hume's "ought" and "is" statement: A radical behaviorist's perspective. *Behaviorism, 10* (1), 1–23.

Vargas, E.A. (1988). Verbally–governed and event–governed behavior. *The Analysis of Verbal Behavior, 6,* 11–22.

Vargas, E.A. (1991). Behaviorology: Its paradigm. In W. Ishaq (Ed.). *Human Behavior in Today's World* (pp. 139–147). New York: Praeger.

Vargas, E.A. (1996). A university for the twenty–first century. In J.R. Cautela & W. Ishaq (Eds.). *Contemporary Issues in Behavior Therapy: Improving the Human Condition* (pp. 159–188). New York: Plenum.

Vargas, E.A. & Fraley, L.E. (1976). Progress and structure: Reorganizing the university for instructional technology. *Instructional Science, 5,* 303–324.

Vargas, E.A. & Vargas, J.S. (1992). Programmed instruction and teaching machines. In R.P. West & L.A. Hamerlynck (Eds.). *Designs for Excellence in Education: The Legacy of B.F. Skinner* (pp. 33–69). Longmont, CO: Sopris West.

West, R.P. & Hamerlynck, L.A. (Eds.). (1992). *Designs for Excellence in Education: The Legacy of B.F. Skinner (Limited Edition).* Longmont, CO: Sopris West.

Wyatt, W.J., Hawkins, R.P., & Davis, P. (1986). Behaviorism: Are reports of its death exaggerated? *The Behavior Analyst, 9,* 101–105.❧

# *TIBI Donors & Levels*

*A*s contributions to the Institute are tax deductable, TIBI has adopted these policies for donors:

*Donors' Benefits, and Amounts and Titles*

*Benefits:* All donors (a) receive at least the benefits of the Affiliate member level (as described in *TIBIA Memberships & Benefits* in this issue) and (b) have their name listed (unless they wish otherwise) under their donor title in at least one issue of *Behaviorology Today* per year.

*Per Year Donors*

| | |
|---|---|
| $50 (to $99): | *Contributor* |
| $100 (to $249): | *Supporter* |
| $250 (to $499): | *Patron* |
| $500 (to $999): | *Sponsor* |
| $1,000 (to $1,999): | *Benefactor* |

*Lifetime Donors*

| | |
|---|---|
| $2,000 (to $4,999): | *Lifetime Contributor* |
| $5,000 (to $9,999): | *Lifetime Supporter* |
| $10,000 (to $19,999): | *Lifetime Patron* |
| $20,000 (to $49,999): | *Lifetime Sponsor* |
| $50,000 or more: | *Lifetime Benefactor* |

*For the Past or Current Year*

| | |
|---|---|
| *Supporter:* | Norman Somach |
| *Supporter:* | Lawrence Fraley |
| *Supporter:* | Doreen Vieitez |
| *Patron:* | Stephen Ledoux ❧ |

# *Volume 7 Number 2 Contents Plan*

*H*ere are some of the featured items planned for the next issue (Fall 2004) of *Behaviorology Today,* although the plans may change:

❧ Behaviorology *and* the Future (Stephen F. Ledoux). [This paper is from the special conference sponsored by the University of Iceland in honor of B.F. Skinner's 100th birthday. Other papers about this conference are also scheduled for inclusion.]

❧ On Verbal Behavior: The Second of Four Parts (Lawrence E. Fraley).

❧ An Introduction to the Philosophy Called Radical Behaviorism (Stephen F. Ledoux).

❧ TIBI Courses and Certificates.

❧ Several updated TIBI course syllabi.

❧ Index for *Behaviorology Today,* Volumes 5, 6, and 7. [Volume 5 included the featured articles from the earlier volumes (1 through 4) that appeared under a different magazine title.]❧

# Syllabus Directory

*E*ach issue of *Behaviorology Today* contains three lists. These lists show where to find only the most up–to–date versions (in title and content) of TIBI's course syllabi. The first list shows syllabi located in the current issue or past issues. The second list shows the schedule (which may change) of syllabi to appear in some future issues. The third list repeats the syllabi locations (actual or planned) but by course number rather than by issue.

## Up–To–Date Syllabi in Current or Past Issues

Volume 7, Number 1 (Spring 2004): BEHG 420:
    *Performance Management and
    Preventing Workplace Violence.*
Volume 7, Number 1 (Spring 2004): BEHG 475:
    *Verbal Behavior II.*

## Syllabi in Some Future Issues

Volume 7, Number 2 (Fall 2004): BEHG 101:
    *Introduction to Behaviorology I.**
Volume 7, Number 2 (Fall 2004): BEHG 201:
    *Non–Coercive Child Rearing Principles and Practices.**
Volume 7, Number 2 (Fall 2004): BEHG 102:
    *Introduction to Behaviorology II.**
Volume 7, Number 2 (Fall 2004): BEHG 425:
    *Non–Coercive Classroom Management and
    Preventing School Violence.**
Volume 7, Number 2 (Fall 2004): BEHG 415:
    *Basic Autism Intervention Methods.**
Volume 7, Number 2 (Fall 2004): BEHG 355:
    *Verbal Behavior I.**
Volume 8, Number 1 (Spring 2005): BEHG 400:
    *Behaviorological Rehabilitation.*
Volume 8, Number 2 (Fall 2005): BEHG 410:
    *Behaviorological Thanatology and Dignified Dying.*
Volume 9, Number 1 (Spring 2006): BEHG 120:
    *Non–Coercive Companion Animal Behavior Training.*
Volume 9, Number 2 (Fall 2006): BEHG 365:
    *Advanced Behaviorology I.*
Volume 10, Number 1 (Spring 2007): BEHG 470:
    *Advanced Behaviorology II.*
Volume 10, Number 2 (Fall 2007): BEHG 250:
    *Educational Behaviorology for Education Consumers.*
Volume 11, Number 1 (Spring 2008): BEHG 340:
    *Educational Behaviorology for Education Providers.*
Volume 11, Number 2 (Fall 2008): BEHG 405:
    *Introduction to Instructional Practices
    in Educational Behaviorology.*

*An older version appeared in an earlier issue.

Volume 12, Number 1 (Spring 2009): BEHG 455:
    *Advanced Instructional Practices
    in Educational Behaviorology.*
Volume 12, Number 2 (Fall 2009): BEHG 445:
    *Advanced Experimental Behaviorology.*

## Syllabi Locations Listed 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 9, Number 1 (Spring 2006).
BEHG 201: *Non–Coercive Child Rearing
    Principles and Practices:*
    Volume 7, Number 2 (Fall 2004).
BEHG 250: *Educational Behaviorology for
    Education Consumers:*
    Volume 10, Number 2 (Fall 2007).
BEHG 340: *Educational Behaviorology for
    Education Providers:*
    Volume 11, Number 1 (Spring 2008).
BEHG 355: *Verbal Behavior I:*
    Volume 7, Number 2 (Fall 2004).
BEHG 365: *Advanced Behaviorology I:*
    Volume 9, Number 2 (Fall 2006).
BEHG 400: *Behaviorological Rehabilitation:*
    Volume 8, Number 1 (Spring 2005).
BEHG 405: *Introduction to Instructional Practices
    in Educational Behaviorology:*
    Volume 11, Number 2 (Fall 2008).
BEHG 410: *Behaviorological Thanatology and
    Dignified Dying:*
    Volume 8, Number 2 (Fall 2005).
BEHG 415: *Basic Autism Intervention Methods:*
    Volume 7, Number 2 (Fall 2004).
BEHG 420: *Performance Management and
    Preventing Workplace Violence:*
    Volume 7, Number 1 (Spring 2004).
BEHG 425: *Non–Coercive Classroom Management and
    Preventing School Violence:*
    Volume 7, Number 2 (Fall 2004).
BEHG 445: *Advanced Experimental Behaviorology:*
    Volume 12, Number 2 (Fall 2009).
BEHG 455: *Advanced Instructional Practices
    in Educational Behaviorology:*
    Volume 12, Number 1 (Spring 2009).
BEHG 470: *Advanced Behaviorology II:*
    Volume 10, Number 1 (Spring 2007).
BEHG 475: *Verbal Behavior II:*
    Volume 7, Number 1 (Spring 2004).❧

# Welcome to the www.behaviorology.org Web Site
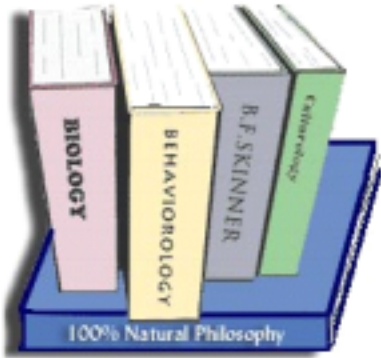
# Behaviorology
.org    .com    .net

**Web site of The International Behaviorology Institute, Ltd., (TIBI)**

**Behaviorology   Conductologia   Xingwei Xue   Gedragsologie   Behaviorologie**

*VISIT THE SITE TO SEE THE COLORS.*

# Welcome

Welcome
Contact Us
Search
Site Map

Sample Community Resources
(Designed for First-Time Visitors)

Complete Behaviorology Community Resources

## About Behaviorology

### Definition, Action, and Benefits

*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 behavior-engineering technologies applicable to behavior related concerns in all fields including child rearing, education, employment, entertainment, government, law, marketing, medicine, and self-management.

### Naturalistic Foundations

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.*

### Independence

Among behavior scientists who respect the philosophy of naturalism, two major strategies have emerged through which their respective proponents would have the natural science of behavior contribute to the culture. One strategy is to work in basic non-natural science units and demonstrate to the other members the kind of effective science that natural philosophy can inform. In contrast, Behaviorologists are organizing an entirely independent discipline for the study of behavior that can take its place as one of the recognized basic natural sciences.

**Visitors this Millennium:** 1,575

This site was completely revised in Spring 2003. Material is added biannually after each print published issue of *Behaviorology Today.*

**\*TIBI is. . .** a non-profit professional organization. TIBI exists to focus behaviorological philosophy and science on a broad range of cultural problems. TIBI sponsors an association (the TIBI Association, or TIBIA) for interested people to join, supporting the mission of TIBI and participating in its activities. *Behaviorology Today* is the magazine and newsletter of the Institute. The guest and staff writers of *Behaviorology Today* provide at least minimally peer-reviewed articles as well as, on occasion and with explicit designation, fully peer-reviewed articles. They write on the full range of disciplinary topics including historical, conceptual, educational, philosophical, experimental, and technological considerations.

Please join us, if you have not already done so - and support bringing the benefits of behaviorology to humanity. Contributions are tax deductible to the full extent of the law.

## Always More at *behaviorology.org*

*B*e sure to visit TIBI's ever–expanding web site regularly (www.behaviorology.org). We are always adding and updating material.

From the *Welcome* screen, you can select the *Sample* page of our *Behaviorology Community Resources* (designed especially for first–time visitors). This page provides a wide selection of useful articles, many from *Behaviorology Today*, in *Adobe* PDF format (with a button to click for a free download of Adobe's Acrobat Reader software, although most computers already have it). The articles are organized on several topical category pages (e.g., contributions to parenting and education, book reviews, and behaviorology around the world). Other selections on the *Sample Community Resources* page feature descriptions of TIBI's certificate programs and course syllabi, and links to some very helpful related web sites.

From the *Welcome* screen or the *Sample Community Resources* page, you can also select the main page of the web site, the *Complete Behaviorology Community Resources* page. This page contains a more complete set of materials, including (a) more articles under the same selection categories as on the *Sample* page, (b) additional article selection categories (e.g., contributions to autism, natural science, outreach, and verbal behavior) each with its own range of pages and PDF materials, (c) many more links to related behavior science web sites, and (d) several new types of selections (e.g., books and magazines pages and PDFs, and upcoming activities).

Visit the web site regularly. After each new issue of *Behaviorology Today,* we link the issue's articles to the relevant selections and categories on the web site.

Explore what interests you. And tell us about your site–visit experience. Your input is welcome, and will help us make further imporvements.

As with any category of regular membership or Donor level, a paid online membership (US$5) earns and supports access to the greater amount of online material included on the *Complete Behaviorology Community Resources* page. (See *TIBIA Memberships & Benefits* in this issue.)❧



## Subscriptions & Back Issues

*P*eople can receive copies of *Behaviorology Today* in ways other than as a member. People can subscribe without membership for US$20, and people can obtain back issues for US$10 each. Photocopy, fill out, and send in the "membership" form on a later page. As applicable, check the "subscription" box, and/or list which back issues you are ordering. *Donations/Contributions* are also welcome, and are tax–deductible as TIBI is non–profit (under 501–c–3).

While supplies last, new subscriptions—with or without a regular membership—will include a copy of each past issue of *Behaviorology Today,* beginning with Volume 5, Number 1, (Spring 2002).❧

## TIBIA Memberships & Benefits

*T*he levels of TIBIA membership include increasing amounts of basic benefits. Here are all the membership levels and their associated, basic benefits:

*Free–online membership.* Online visitors (who may or may not elect to register online as a free *member)* receive benefits that include these: (a) access to selected, general interest *Behaviorology Today* articles and links, (b) access to Institute information regarding TIBI Certificates and course syllabi, and (c) access to previews of the benefits of other membership levels.

*$5* (to $19) *Basic–online membership.* Online visitors who pay the $5 online dues earn benefits that include these: *All* the benefits from the previous membership level plus (a) access to all *Behaviorology Today* articles and links online, (b) access to TIBIA member contact information online, and (c) access to special organizational activities (e.g., invitations to attend TIBI conferences, conventions, workshops, etc.).

*$20* (to $39) *Subscription membership.* Those who mail in (by regular post) the $20 subscription fee and form receive benefits that include these: *All* the benefits from the previous levels plus a subscription to the paper–printed issues of *Behaviorology Today* (ISSN 1536–6669).

Contribution amounts beyond these first three levels are *Donor* levels, which are described in *TIBI Donors & Levels* in this issue. All memberships are per year. The next four membership levels (Student, Affiliate, Associate, and Advocate) were the Institute's original membership categories, and so are sometimes designated the "regular" membership levels. Here are these regular membership levels and their basic benefits:

$20 *Behaviorology Student membership* (requires paper membership application co–signed by advisor or department

chair, and dues payment—see *TIBIA Membership Criteria & Costs* in this issue). Benefits include *all* those from the previous levels plus these: Access to all organizational activities (e.g., invitations to attend and *participate* in meetings conferences, conventions, workshops, etc.).

$40 *Affiliate membership* (requires paper membership application, and dues payment—see *TIBIA Membership Criteria & Costs* in this issue). Benefits include *all* those from the previous levels plus these: Access to advanced levels for those acquiring the additional qualifications that come from pursuing a professional behaviorology track.

$60 *Associate membership* (requires paper membership application, and dues payment, and is only available to qualifying individuals—see *TIBIA Membership Criteria & Costs* in this issue). Benefits include *all* those from the previous levels plus these: TIBIA voting rights.

$80 *Advocate membership* (requires paper membership application, and dues payment, and is only available to qualifying individuals—see *TIBIA Membership Criteria & Costs* in this issue). Benefits include *all* those from the previous levels plus these: May be elected to hold TIBIA or TIBI office.

## Other Benefits

Beyond the intrinsic value that TIBIA membership bestows by virtue of making the member a contributing part of an organization helping to extend and disseminate the findings and applications of the natural science of behavior for the benefit of humanity, and beyond the benefit of receiving the organization's publications, TIBIA membership benefits include the following:

❧ Members will have opportunities to present papers, posters, and demonstrations, etc., at the organization's meetings;

❧ Members paying regular dues in the last third of the calendar year will be considered as members through the end of the following calendar year;

❧ Members paying regular dues in the middle third of the calendar year will be allowed to pay one–half the regular dues for the following calendar year;

❧ A TIBIA member may request the Institute to evaluate his or her credentials to ascertain which TIBI certificate level most accurately reflects the work (and so, by implication, the repertoire) behind those credentials. The Institute will then grant that certificate to the member; as part of this evaluation, the Institute will also describe what work needs to be accomplished to reach the next certificate level. The normal processing fee for this service (US$20) will be waived for members. For the processing fee of US$20, a non–member may also request this evaluation and, should she or he

ever join TIBIA, the US$20 already paid will be applied to the initial membership dues owed. (Faculty teaching behaviorology courses can encourage their students to request this evaluation.)

TIBIA continuously considers additional membership benefits. Future iterations of this column will report all new benefits upon their approval.☜☞

# TIBIA Membership Criteria & Costs

*T*IBIA has four categories of regular membership, of which two are non–voting and two are voting. The two non–voting categories are Student and Affiliate. The two voting categories are Associate and Advocate. 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.

Admission to TIBIA in the Student membership category shall remain open to all persons who are undergraduate or graduate students who have not yet attained a doctoral level degree in behaviorology or in an acceptably appropriate area.

Admission to TIBIA in the Affiliate membership category shall remain open to all persons who wish to maintain contact with the organization, receive its publications, and go to its meetings, but who are not students and who may not have attained any graduate degree in behaviorology or in an acceptably appropriate area. On the basis of having earned TIBI Certificates, Affiliate members may nominate themselves, or may be invited by the TIBI Board of Directors or Faculty, to apply for an Associate membership.

Admission to TIBIA in the Associate membership category shall remain open to all persons who are not students, who document a behaviorological repertoire at or above the masters level or who have attained at least a masters level degree in behaviorology or in an acceptably appropriate area, and who maintain the good record—typical of "early–career" professionals—of professional 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. On the basis either of documenting a behaviorological repertoire at the doctoral level or of completing a doctoral level degree in behaviorology or in an acceptably appropriate area, an Associate member may apply for membership as an Advocate.

Admission to TIBIA in the Advocate membership category shall remain open to all persons who are not stu-

dents, who document a behaviorological repertoire at the doctoral level or who have attained a doctoral level degree in behaviorology or in an acceptably appropriate area, who maintain a good record of professional accomplishments of a behaviorological nature, and who demonstrate a significant history—typical of experienced professionals—of work supporting the integrity of the organized, independent discipline of behaviorology including its organizational manifestations such as TIBI and TIBIA.

For all regular membership levels, prospective members need to complete the membership application form and pay the appropriate annual dues.

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. Thus, the annual dues for each membership (or other) category are:

| Category | Dues (in US dollars)* |
|---|---|
| Board of Directors member | The lesser of 0.6% of annual income, or $120.00 |
| Faculty member | The lesser of 0.5% of annual income, or $100.00 |
| Advocate member | The lesser of 0.4% of annual income, or $80.00 |
| Associate member | The lesser of 0.3% of annual income, or $60.00 |
| Affiliate member | The lesser of 0.2% of annual income, or $40.00 |
| Student member | The lesser of 0.1% of annual income, or $20.00 |

*Minimums: $20 director or faculty; $10 others

# TIBIA MEMBERSHIP APPLICATION FORM
## (SEE THE NEXT PAGE FOR THE TIBI / TIBIA PURPOSES.)

*Copy* and complete this form (please type or print)—*for membership or contributions or subscriptions or back issues*—then send it with your check (made payable to TIBIA) 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: ☐
Subscription:* ☐
Back issues:* ☐
 ❧ Vol. ___, #___
 ❧ Vol. ___, #___

Name: _____

Office Address: _____

_____

_____

_____

Office Phone #: _____

Fax #: _____

E-mail: _____

Degree/Institution:** _____

Member Category: _____ ☐

Amount enclosed: US$ _____

Home Address: _____

_____

_____

Home Phone #: _____

CHECK PREFERRED MAILING ADDRESS:

Office: ☐          Home: ☐

*Sign & Date:* _____

*Subscriptions: US$20/year; back issues: US$10 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*

$\mathcal{T}$IBI, as a non–profit educational corporation, is dedicated to many concerns. TIBI is dedicated to teaching behaviorology, especially to those who do not have university behaviorology departments or programs available to them; TIBI is a professional organization also dedicated to expanding the behaviorological literature at least through the magazine/newsletter *Behaviorology Today* (originally called *TIBI News Time*) and the *Behaviorology and Radical Behaviorism* journal;** TIBI is a professional organization also dedicated to organizing behaviorological scientists and practitioners into an association (The International Behaviorology Institute Association—TIBIA) so they can engage in coordinated activities that carry out their shared purposes. These activities include (a) encouraging and assisting members to host visiting scholars who are studying behaviorology; (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 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 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 the 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.
 **This journal (BARB) is under development at this time and will appear only when its implementation can be fully and properly supported.—Ed.