

# Behaviorology Today

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*Conductologia*

*Xingwei Xue*

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*Behaviourology*

## 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.

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**N**OTE: This issue does not contain any TIBI online course syllabus. In some future issues, new syllabi or updates of previous syllabi will appear. (See the *Syllabus Directory* near the back of each issue.)—Ed.

## Volume 13 Number 2 Contents Plan

Here are some of the featured items planned for the next issue (Fall 2010) of *Behaviorology Today*, although these plans may change:

- ✻ *Single Parenting: When It's All Up to You* (Glenn I. Latham)
- ✻ *Multiple Selectors in the Control of Simultaneously Emissible Responses* (Stephen F. Ledoux).
- ✻ An article or two from among those that may be in process from various guest authors. *When will YOUR article arrive?* (Staff writers can maintain the publication schedule with worthy contributions, but worthy articles from guest authors make even more valuable disciplinary literature contributions.)—Ed. ☺

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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, 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.) ☺

# ***Increasing Tact Control and Student Comprehension through such New Postcedent Terms as Added and Subtracted Reinforcers and Punishers***

**Stephen F. Ledoux**

*State University of New York at Canton*

**Editor's Note:** Occasionally, *Behaviorology Today* (BT) includes a piece that has gone through a full peer-review process. According to BT policy, when this is the case, a very clear notice to that effect is to be included with the piece. In compliance with this policy: **THIS PAPER HAS BEEN FULLY PEER REVIEWED.**

The material in this paper evolved as the author regularly presented it to his classes starting in 1988. The material achieved its present form in early 1992. Some additional years of use with students showed little need for further revision. The paper was then submitted to *The International Behaviorologist* (TIB) for formal peer review. In August 1994 the editor of TIB, Joe Cautela, accepted the paper for publication in the second issue of that journal. However, by the time the book of readings, *Origins and Components of Behaviorology* (Ledoux, 1997/2002) was being assembled, the first issue of TIB had not yet been published (nor has any issue yet appeared). Hence this paper was first included in that book of readings before now appearing here in this journal.—Ed. ✻

The verbal behavior of scientists plays a crucial role in their continuing to operate effectively with respect to the principles and practices of their science. As behaviorology changes through advances in research and technology, the terms used to describe the parts and processes of the science may also change. If newer terms enable more accurate tacting of those parts and processes than the older terms, if newer terms enhance effectiveness and reduce confusion, then the newer terms may become widely adopted.

The concern with terminology is also often felt in circumstances where behaviorological scientists need to describe research variables, experimental findings, and the resulting implications and technological applications to persons not yet familiar with even the fundamental laws

discovered by their science (e.g., students). If confusion is not avoided at this early point, it becomes even harder to deal with later when more complex issues receive scrutiny.

Over the last two decades, this author has considered the suggestions of various authors (e.g., Comunidad Los Horcones, 1987; Vargas, 1984, 1985) regarding the terms to use when describing the variables involved in behaviorological processes, especially in the fundamental selective processes of reinforcement and punishment. This author has also tried a variety of terms in the classroom. These efforts to improve terminology have been focused on terms which concern events in the position of the third term of the three-term contingency, the events that follow the occurrence of some type of behavior. In the last couple of years, a particular set of systematically related terms—some old and some new—has evolved from these efforts. This set of terms has been used successfully in the author's classroom. These terms evoke less confusion than other terms evoke; they seem easier to learn and use.

This paper presents that systematic set of terms. To start, it considers the problems addressed by these terms. Then it considers solutions provided both by particular terms and by the organization of this set of terms. This set also respects, and in a small way extends—through the use of the term “selector,” the evolutionary perspective shared by the different levels of life-science disciplines (see Glenn & Madden, 1995).

## **Problems**

Different terms have different histories. Some terms have had a long and useful history, such as reinforcers and punishers which denote the stimuli whose post-behavior energy change at receptor cells ultimately selects physical changes that appear later as changes in the frequency of behavior. Other terms, such as positive and negative that have been used to describe certain types of reinforcers and punishers, have a history of causing confusion. This long-standing problem needs a solution.

The confusion occurs because the terms positive and negative have connotations in non-technical language that compete with their technical usage. In everyday usage positive connotes good or pleasant while negative connotes bad or unpleasant. As a result people have some difficulty with the concept of a *negative* reinforcer strengthening behavior. They have even greater difficulty with the concept of *positive* punishment; they have trouble imagining much that is positive about punishment.

Another question is more of an issue than a problem. This question concerns how to integrate the various proposed terms that have arisen from the expansion of the

science, and especially its conceptualization of causality, into a systematic set of terms.

## Solutions

A solution to the problem of the terms positive and negative is to replace them with terms having the same technical connotation but not having other, competing connotations. The terms that the author has found to work the best with his students are the terms *added* to replace positive and *subtracted* to replace negative. These terms lack the complicating connotations of positive and negative. Yet at the same time they are consistent with the signs (i.e., + and -) used in the symbols for the several types of reinforcing and punishing stimuli. Furthermore, by using the terms added and subtracted, the replaced terms of positive and negative are still available to be used in their non-technical sense without confusion. That usage would no longer cause confusion with their technical usage because they would no longer have a technical usage. For example, using the common, non-technical connotations of the terms, one could speak non-technically of rewards and punishments as positive and negative

consequences respectively without fear of automatic confusion with technical terms.

Alternative solutions to the problems of the terms positive and negative are available. The author has also tried replacing positive and negative with *plused* and *minused*, and with *additive* and *subtractive*. But each of these pairs had its own difficulties, and neither worked as well with students the way added and subtracted worked. Another suggestion, for which this author cannot claim originality, is simply to drop the terms positive and negative. But this alternative seemed to cause even more confusion for students, not less.

An answer to the question of how to integrate various proposed terms into a systematic whole comes from the hierarchical nature of the different questions about events that different terms can address. The focus narrows onto more and more specific characteristics of the events as these questions are asked: Does the event precede or follow the behavior? Does the event affect subsequent responding? Is the event produced by responding? Is the effect of the event to increase or decrease the frequency of the type of behavior the event followed? Does the effect occur when the event occurs as a presentation of a stimulus or as the reduction of a stimulus? (Each possible an-

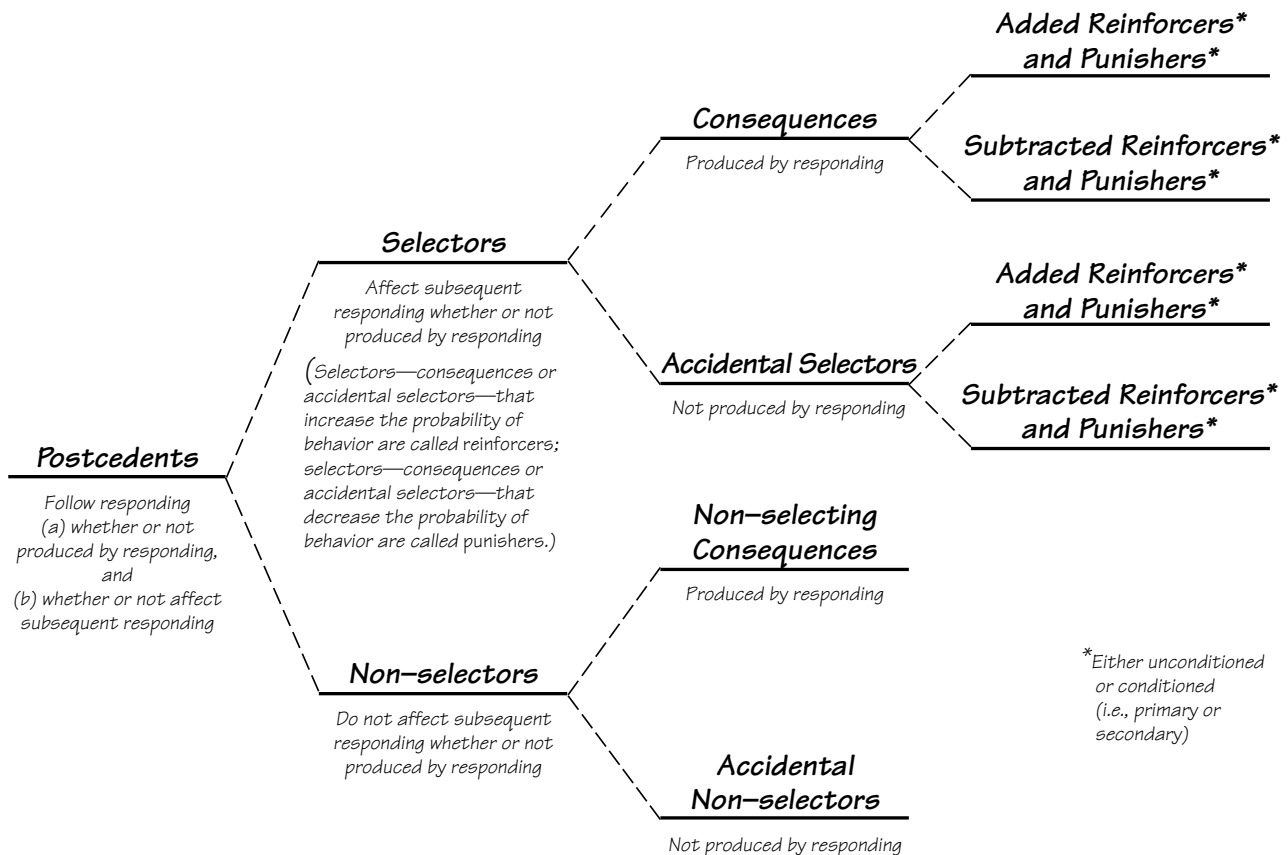


Figure 1. Diagram of the interrelated terms for various postcedent events in increasing specificity.

swer, of course, requires the next question to be asked more than once, with a corresponding increase in the number of terms properly applicable to a particular event.)

Different terms can be used to differentiate all the different types of events implied by the possible answers to those questions; the definitions of the terms also derive from the answers to those questions. The terms so used here are postcedents, selectors, consequences, accidental selectors, and the opposites of these (plus added and subtracted reinforcers and punishers as already described).

**Postcedents** (following Vargas, 1984, 1985) are events that follow responding regardless of whether or not they are produced by responding *and* regardless of whether or not they affect subsequent responding. The opposite of postcedents is “antecedents” (which will be discussed elsewhere).

**Selectors** are postcedents that affect subsequent responding regardless of whether or not they are produced by responding. The opposite of selectors is “non-selectors”; non-selectors are postcedents that do not affect subsequent responding regardless of whether or not they are produced by responding.

**Consequences** are selectors (affecting subsequent responding) that are produced by responding. The opposite

of consequences is “non-selecting consequences”; non-selecting consequences are non-selectors (not affecting subsequent responding) that are produced by responding.

**Accidental selectors** are selectors (affecting subsequent responding) that are not produced by responding. The opposite of accidental selectors is “accidental non-selectors”; accidental non-selectors are non-selectors (not affecting subsequent responding) that are not produced by responding.

Figure 1 provides a diagram of these systematically related old and new terms for various postcedent events, in increasing specificity. Figure 2 provides even further specific details concerning consequences and accidental selectors.

The hierarchy of the terms can also be seen in the breakdown of the sixteen varieties of the selector type of postcedents. Of these sixteen, eight are produced by responding (called consequences) and eight are not produced by responding (called accidental selectors). Of each of these eight, four are types of reinforcers and four are types of punishers. Of the four types of either reinforcers or punishers (regardless of whether they are consequences or accidental selectors), two have their reinforcing or punishing effect when they are added to

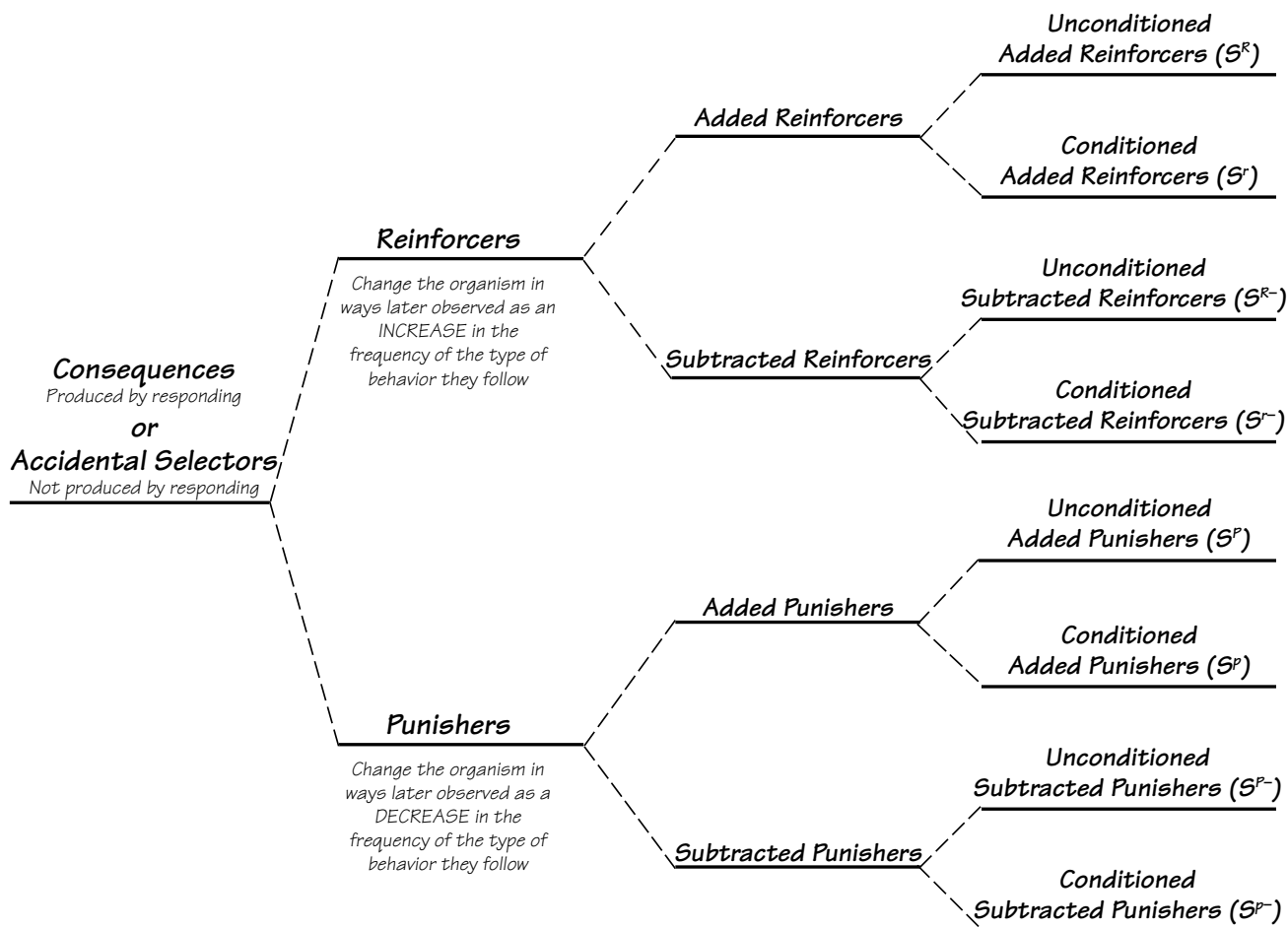


Figure 2. Details concerning consequences and accidental selectors.

the situation while the other two have their reinforcing or punishing effect when they are subtracted from the situation. Of each two types of added or subtracted reinforcers or punishers, one is unconditioned (primary) and the other is conditioned (secondary).

A more general perspective is achieved by returning to antecedents, the opposite of postcedents. Antecedents occupy the first position in the three-term contingency as events that precede the occurrence of some type of behavior. Antecedents can be one of two types. (1) Antecedents can be events that both precede a behavior and affect that behavior; in this case they can be called setting events. Leigland, 1984, argued that the nature of the term *setting events* was rather general. He pointed out:

The functional relations that *are* subsumed by the term include what may be complex or conditional discriminative stimuli, deprivation/satiation variables, and perhaps others left unspecified. (p. 42)

Yet this general nature is what makes the term usable here (also, see Vargas, 1985). Or (2) antecedents can be events that precede a behavior but do not affect that behavior; in this case they may be called *non-setting events*. Antecedents that are setting events can be of several types, including discriminative stimuli, establishing operations (Michael, 1982), abolishing operations (Leigland, 1984), etc. While this pattern addresses questions similar to those raised in the discussion of postcedents, further elaboration of antecedents goes beyond the scope of this paper.

## Summary

In summary, the following conventions are offered as an adjusted elaboration of those provided by Vargas (1985, p. 132):

*For the placement of events in time, use:* antecedent—current event—postcedent.

*For the general three-term contingency, state:* setting events—behaviors—selectors.

*For more specific three-term contingencies, indicate:* one or more setting events—an overt or covert action, response (etc.)—a consequence or accidental selector.

*For an explicit three-term contingency, specify (for example):* a discriminative stimulus—a response class—an added reinforcing stimulus.

The author has found that the set of terms used in those conventions reduces the confusion about terminology that students in the past experienced on their initial contact with behaviorological science. Others who teach the science may find this set to be of similar value. Perhaps researchers in the science will also find their tacting to be more accurate, and hence their effectiveness enhanced, through use of this set of terms. ✻

## Endnotes

The author sent this paper to *The International Behaviorologist* on 11 February 1994. After full peer review, it was accepted by early May 1994. However, that journal's publication schedule had fallen behind (see Fraley & Ledoux, 1997/2002, Ch. 4), so the paper received further minor revisions both for presentation at the ninth annual convention of The International Behaviorology Association in Plymouth, MA, March 1997, as well as for inclusion in *Origins and Components of Behaviorology* (Ledoux, [1997/2002]).

The author thanks Joe Cautela and the other reviewers for their help on this paper. Address correspondence regarding this paper to the author at SUNY-CTC, Canton NY 13617-1096 USA.

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# Two Behaviorology Measurement Projects for Behaviorology Graduate Students

Lawrence E. Fraley

Professor of Behaviorology (retired)

## Introduction

For many years during my university teaching career I taught a behaviorology course in behavior measurement to graduate students. One objective of that course was to teach students to measure behavior in ways that permitted them to detect and reveal subtle changes in behavior. This article presents a two-project sequence that I designed for the students in that course. The first is a group project during which students could effectively help each other learn how to approach such measuring tasks. The second project was then pursued individually. These projects demanded a substantial amount of creative engineering with respect to the technology of behavior measuring, because the development of appropriate measures and measuring techniques was left to the students as an important aspect of these projects. I have also included the evaluation arrangements with which I graded student performance on each of these projects.

§

## I. Group Project:

### Multiple Dimensions of Behavior

Behavior has several dimensions that can be measured. When behavior changes, the change occurs in one or more of those dimensions. The dimensions of a behavior need to be measured independently, and each dimension must be examined separately for change, because one cannot be sure in advance which dimensions of a behavior are going to change, nor by how much. When the contingencies that control a behavior are altered (or the behaving organism is changed, as in fatigue), the question is not whether the behavior will change (it will) but which dimensions or properties of the behavior are going to change.

Below is a list of some dimensions of behavior that can be measured:

1. Topography or form of a movement.
2. Intensity or amount of force of movement.
3. Extensity or amount of distance covered by a movement (its geometrical dimensions).
4. Latency or delay between the onset of the opportunity for a movement to occur and the time that that movement begins.
5. Duration of a movement, or “how long a movement lasts.”
6. Number of movements that occur; number of repetitions of a behavior; number of cycles; (the amount of behavior that occurs).
7. Rate of behavior; quantity represented by the quotient when number of movements is divided by the time across which the count was made; ratio of cycles to time elapsed while the cycles were counted. [Note that Johnston & Pennypacker (1980) defined rate differently. In their rate measure the time interval in the denominator was decreased by the sum of the durations so that rate becomes the ratio of the cycles to the total time during which behavior was *not* occurring.]
8. Celeration; the rate of change in the rate of a movement.

## Assignment

**Overview.** The class, acting as a team, will select a behavior and plan how to measure each of the above dimensions of that behavior. A naive subject will then be put under contingencies to emit the selected behavior, all dimensions of which will then be measured. The contingencies on the subject will then be altered in such a way as to produce a gradual change in the behavior, and the exact nature of the resulting change will be revealed and analyzed by developing a multidimensional profile of the change. The shift in the contingencies on the behavior may be continuous or incremental.

Note: The behavior change should be a small effect; a *subtle* change in behavior is to be produced and measured in this project.

### Specific steps.

1. Read and think about the project assignment. Consider possible behaviors that might be suited to your measurement capabilities.
2. Meet as a group, choose a coordinator, and exchange ideas about the project. Goals for this meeting: (A) Select

a behavior and determine, at least in a general way, the nature of the contingencies to be applied in producing the behavior and making it change. (B) Develop plans for measuring each of the dimensions of that behavior.

You might need to arrange for pilot tests of potential measurement practices to test their feasibility.

It may be necessary to construct special pieces of apparatus.

General ideas may have to be refined and recast in more detail.

These and other such tasks might have to be assigned to individuals or subgroups to be addressed prior to the next meeting of the group.

3. Meet again as a group and continue the preparations for collecting the behavior data. Recruit and schedule the participation of a naive subject.
4. Meet again for the third time as a group and make final preparations. Be sure that all measurement practices have been tested and will reliably provide the necessary behavioral data. Be sure that the planned contingencies on the subject and planned changes in those contingencies are likely to produce the kinds of behavior and behavioral changes that you can accommodate with your measurement techniques. *[Throughout these preparatory activities do not expose your experimental subject to the experimental conditions. The subject must remain naive with respect to the contingencies to which he or she is to be subjected. If pilot studies are needed, use someone else.]* Divide the tasks to be undertaken during the data collection session so that all members of the team know just what to do.
5. Conduct the data collection session. Make all measurements and record the data.
6. Prepare an illustrated report showing what was done and what happened. Emphasize the nature of the contingencies to which the subject was exposed and how those contingencies changed. Describe the initial behavior and how it changed as the contingencies were altered, and provide those descriptions in terms of the various dimensions of the behavior. Make clear which dimensions changed and by how much, and identify any dimensions that did not change. Provide a discussion and conclusion section. Cycle the drafts among the team members for editing (divide the task of preparing the initial draft in whatever way seems best to the group).

7. Submit the completed report to the instructor.

### ***The Project Grade (for each team member)***

1. Quality of individual participation in the project 25%
2. Quality of the group report 75%

## **II. Individual Project: Properties, Dimensional Quantities, & Units of Behavior Measurements (PDQUBM)**

*Consult course calendar for timetable on the steps in this project.*

### ***Preparation:***

Study the following sources:

- ✻ Springer, B., et al. Current measurement in applied behavior analysis. *The Behavior Analyst*, 4 (1), 1981 (Spring), pp. 19-31.
- ✻ Johnston, J., & Pennypacker, H. (1980) *Strategies And Tactics of Human Behavioral Research*. Hillsdale, NJ: Lawrence Erlbaum. *(Study Chapter 7 in its entirety. Examine with special care pages 126-131, including Table 7.1. Also, learn to discriminate among the dimensional quantities discussed on pages 132-139.)*

### ***In-Class Teaching Assignment***

Each member of the class will be assigned one of the dimensional quantities used to measure behavior (listed in Table 7.1 and discussed separately on pages 132-139). Prepare a short in-class presentation intended to teach about that quantity. Use visuals as necessary or helpful to define your assigned quantity, to illustrate it, and to clarify its concept. Show how it differs from the others. Answer any questions pertinent to your assigned quantity that are asked by class members. These presentation/discussion sessions should range from about 10 to 15 minutes each.

### ***Individual Out-of-Class Project***

Working alone, select for study a simple behavior of interest. A typical response in the selected operant should consist of a very few clearly visible elements. Identify various relevant dimensions of a typical response in the selected operant (*see middle column of Table 7.1 in Johnston & Pennypacker, p. 128*). If the responses have separate behavioral elements, you can do a finer grained analysis by performing the dimensional analysis for each element.

Determine how to measure each dimension that you deem important to a typical response. If you are dealing with separate elements of the response, determine how you will measure each behavioral element in the responses.



Get two or three human subjects and have each of them perform the behavior under circumstances as identical as possible. Measure independently each of the separate dimensions of behavior that you have determined to be important to the task, and, if you are analyzing separate elements of the responses, do that for each element of the responses. Considering the elements of a response separately would be important in certain cases—for example, when the behavior would be improved by a shift in the relative durations or order of the behavioral elements within a typical response. Independent measures of the components of the responses would then be necessary to detect changes in those component properties. (*See note on the experimental station, below.*)

After baseline conditions have been run, make at least one change in the prevailing contingencies (do this in the same manner for each subject). The events designated by “E” in Figures 7.3 and 7.5 (Johnston & Pennypacker [J&P]) might function so as to change the contingencies on the subject. The introduced change in the contingencies should be minor so as to produce only a small or subtle change in the behavior of concern. Continue the measurements through that phase. (Optional: You may vary or enhance this simple AB design if doing so seems appropriate, perhaps by returning to baseline conditions, or whatever, but that is not strictly required in this project.)

Develop an appropriate data display to make obvious any detected variation in each dimension of behavior. Do this for each component of the responses (or for the whole response) for each subject. Figures like those numbered 7.1-7.5 can be employed (see J&P, pp. 132-136). Provide additional displays as appropriate to show differences among the subjects used in your project. Relate changes in one dimension of behavior to changes (or lack of changes) in other dimensions. Show how changes in the prevailing contingencies affected the various dimensions of the behavior. Deal with computed dimensional quantities as well as with the single factor dimensions that you directly measure. (Note: Celeration cannot be very meaningful if only two data points are available with which to determine it; simply make note of this fact in your presentations and reports.)

*NOTE ON EXPERIMENTAL STATION: For the purposes of experimental control and the collection of useful data, an experimental station will be available for your use. At this station you can make a videotape of each subject's behavior. Visible in the setting you can arrange a clock with sweep second hand, a digital timer, etc. When reviewing the tape, you can make the necessary measurements that you might not have been able to perform during the session. Do not neglect the possibility of choosing a behavior that is wholly, or partly, self-timing and/or self-counting. If you attempt to measure a response by visual observation and a*

*hand-held timer, select a target behavior that is sufficiently slow in occurring to be measured in that manner.*

**Assignment on Presentation of Results**

1. Prepare a written report with illustrative figures. Explain what was measured in terms of “properties” and “dimensional quantities” (see J&P, Table 7.1, p. 128). Present and discuss the results. Explain difficulties encountered and include recommendations for subsequent projects (How would you do it next time?).

In a separate section of your written report (appropriately subtitled) provide a behavioral analysis of the J&P omission of durations from the time used in the denominator when calculating rates. What are the differences in “meaning” between the traditional rate and the J&P rate? What differences can be expected in the behavior of the users of these different rate values? Explore implications. Is the J&P version really any better? If so, why? ...and how so? (See p. 138, lines 7-22.)

2. Make an in-class presentation of your project, including visuals as appropriate. Tell what you did, how you did it, and what you learned. These presentations can last up to half an hour. Consult the instructor in advance for your time allowance.

**Grading on this Project**

Three category grades are attached to this project, each with its own criteria to which “intra-category” credit is attached. The relative weighting of the grades on these parts is indicated below:

- A. In-class teaching assignment 10%
- B. In-class presentation of project 20%
- C. Written report of project 70%

Below are the instructor's grading forms by which your performance on each of the above categories will be evaluated separately:

<u>A. Criteria for in-class teaching assignment</u>	<u>Points</u>
1. length of presentation: acceptable / short / long	2
2. effectiveness of personal style	2
3. overall clarity of explanation	6
4. comparisons made with other dimensions	4
5. effectively answering questions / leading discussion; getting class involved	5
6. quality/effectiveness of visuals (figures, graphs, etc.)	5
	24

In-Class Teaching Grading Scale:

- 20-24: A    18-19: B    16-17: C    15: D    0-14: F

- B. Criteria for in-class presentation of completed project:
1. length of presentation: acceptable / short / long 2
  2. effectiveness of personal style 2
  3. effectively answering questions / leading discussion; getting class involved 5
  4. quality / effectiveness of visuals (including sufficiency) 6
  5. choice of behavior for study 4
  6. overall clarity of explanation; making clear what you did, how you did it, and what resulted 6
- 25

In-Class Presentation Grading Scale:

21-25: A 19-20: B 17-18: C 15-16: D 0-14: F

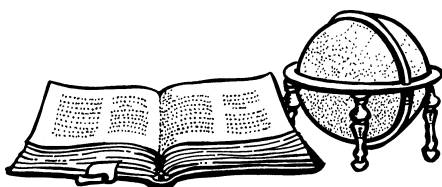
- C. Criteria for the written report:
1. form and style 3
  2. suitability of chosen behavior 4
  3. adequacy of set of dimensions selected to be measured 5
  4. quality of measurements 5
  5. demonstrating a change in contingencies from behavioral effects 4
  6. clarity of explanation: what you did; methods; results 6
  7. Adequacy/sufficiency of graphics 6
  8. Analysis of implications of different concepts of rate 5
  9. Summary/conclusions/discussion: adequacy, validity, significance 6
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Written Report Grading Scale:

40-44: A 37-39: B 34-36: C 31-33: D 0-30: F ✽

## Endnotes

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# Research Needed on Behavior Skills Training to Teach Young Workers Workplace Safety Skills

Barry J. Berghaus

Capella University

Young workers find themselves at an increased risk for accidents, injuries, and death on the job but there have been few studies of methods for improving on-the-job safety in young workers. A substantial body of literature shows increased *in vivo* safety behaviors in children, adolescents, and adults following behavior-based safety training programs. This paper describes recommended applied research on a behavior skills training (BST) program for young workers to determine whether BST with *in vivo* training is superior to a standard organizational safety training program.

## Problem Statement and Setting

A local temporary employment agency runs a Summer Youth Employment Program (SYEP) for local organizations that hire young (16-19 year-old) people to work on a variety of seasonal projects including lawn maintenance, planting, painting, roofing, minor construction and building repair, and window washing. Data collected by the organizations and temporary agency show that this group of workers is more likely to suffer work-related injuries than are other employees working in similar capacities.

According to estimates by the Bureau of Labor Statistics (BLS) (2002), occupational accidents in the United States cost organizations 250,000 productive years of employee life and service every year. Young workers present the highest rate of risk for occupational injury. Workers between the ages of 16 and 19 suffered 38,230 nonfatal workplace injuries (BLS, 2004a) and 128 workplace fatalities (BLS, 2004b) during 2004. Workers in this age group are often newer or temporary employees such as students hired for summer work. These employees, especially those with less than one year of experience on the job, are overrepresented in their share of workplace injuries (about 34%) when compared to their share of the workforce (about 25%) (BLS, 2004a).

As a source of substantial direct and indirect costs, safety is a major concern for organizations. Based on industry reports from 1997, The National Institute for Occupational Safety and Health (NIOSH, 1999) concluded that U.S. corporations provide nearly 2 billion hours of

training to approximately 60 million employees at a cost of \$55 to \$60 billion. In addition, many organizations view safety as an important variable in organizational culture that may impact trust, teamwork, and a sense of belonging (Geller, 2002). Safety has also become an important issue for organizational researchers as they attempt to discover which organizational and individual variables impact safety and develop programs to improve safety behavior while reducing workplace injuries and accidents. However, many publications describing organizational safety training methods do not provide evidence of effectiveness (Cohen & Colligan, 1998) and it seems likely that many organizational development strategies go untested.

From a management perspective, Dubin, Mezack, and Neidig (1974) suggest that, with regard to employee development programs, the most basic question to ask is, "Have changes occurred as a result of this program?" Thus, when organizations adopt new and expensive training programs, they should expect evidence of efficacy, and organizational developmental specialists should be prepared to demonstrate a program's efficacy.

There is little research into programs designed specifically to train young workers in on-the-job safety skills even though there is evidence that they are especially likely to be injured on the job. Furthermore, the training programs used generally in organizations are largely untested. Therefore, this recommended research is designed to test one training method, behavior skills training (BST), for young, temporary (SYEP) workers to determine its effect on scores from knowledge-based safety assessments, on-the-job safety, and workplace injuries.

### **Review of Related Literature**

There is a substantial body of literature supporting the efficacy of behaviorally based interventions to improve the safety behavior of children, adolescents, and adults (Geller, 2005; Gras, Cunhill, Planes, Sullman, & Oliveras, 2003; Heck, Collins, & Peterson, 2001; Miller, Austin, & Rohn, 2004; Roll, 2005). Several studies have used BST or very similar procedures to improve safety behavior. For example, Himle, Miltenberger, Flessner, and Gathridge (2004) and Miltenberger, Flessner, Gathridge, Johnson, Satterlund, and Egemo (2004) used a BST program to teach gun safety (do not touch, leave the area, tell an adult) to young children (4-5 year-olds and 6-7 year-olds respectively). The behavior skills programs included trainers modeling correct safety behaviors, practice of safety behaviors by the children, praise for correct responses and corrective feedback for incorrect responses, *in situ* training (training in an actual "found gun" situation), realistic training materials in multiple training situations to promote an active learning approach, positive reinforcement for correct responses, and generalization of skills. Himle, Miltenberger, Gathridge, and Flessner (2004)

and Gatheridge, Miltenberger, Huneke, Satterlund, Mattern, Mattern, Johnson, and Flessner (2004) compared behavior skills training to the Eddie Eagle GunSafe Program (National Rifle Association, 2005) and found that both programs were effective in teaching children to verbally reproduce the gun safety message ("Stop, Don't Touch, Leave the Area, Tell an Adult") but only BST was effective in teaching the children to perform the safety behaviors during supervised role play.

Johnson, Miltenberger, Egemo-Helm, Jostad, Flessner, and Gathridge (2005) used BST with *in situ* training to teach 4- and 5-year-olds abduction prevention skills which were maintained at two-week and one-month follow-ups.

Heck, Collins, and Peterson (2001) demonstrated that structured, interactive training and small individual rewards (certificates, ribbons, stickers, and posters) based on overall group performance decreased risk taking behaviors in Kindergarten through third graders. (Risk taking behaviors have been shown to increase the likelihood of playground injuries; see Ward, 1987, as cited in Heck, Collins, & Peterson, 2001.)

Miller, Austin, and Rohn (2004) compared the effects of a national pedestrian safety awareness program with behavioral intervention strategies including training, feedback, and reinforcement. They found significant improvement when the two strategies were combined but no improvement when the safety awareness program was used by itself.

A common safety training method is to instruct employees to read safety literature including safety brochures, product manuals, and MSDS (material safety data sheets) books (Eckerman, Lundeen, Steele, Fercho, Ammerman, & Anger, 2002). Eckerman, et al., (2002) found, however, that participants who received an interactive instructional method that followed consensus behavioral education principles scored significantly better on test questions about the training material than did participants who simply read the material. However, the study was limited because no test of on-the-job safety behavior was completed.

There is a growing body of literature showing that organizational safety climate affects individual employee safety behavior and on-the-job accidents (e.g., Neil & Griffin, 2006). However, temporary or summer employees may not work at an organization long enough to experience safety climate improvements and the lagged effect that Neil and Griffin (2006) found between safety climate, safety motivation, and safety behavior.

### **Research Hypotheses**

**Null Hypothesis.** BST with *in situ* training is no more effective at teaching safety-skill knowledge, improving on-the-job safety, and reducing workplace injuries in SYEP workers than is the standard safety training procedure.

**Working Hypothesis.** BST with *in situ* training is significantly more effective than the standard safety training procedure at increasing safety-skill knowledge, improving on-the-job safety behavior, and reducing workplace injuries in SYEP workers.

### **Definition of Research Variables**

**Independent Variable.** The independent variable for this study is the safety training used to teach safety skills to SYEP workers. Two conditions comprise levels of the independent variable:

✦ Standard safety training program as currently used by the temporary employment agency for SYEP training.

✦ Safety training protocol using BST with *in situ* training.

**Dependent Variables:** In this study four dependent variables will be measured:

✦ Test scores from a test of basic safety knowledge. (This test has been used by the temporary employment agency for several years. Trainees must obtain a score of 80% to start work.) Validity and reliability have not been established. However, the test designers believe it has good face validity. Data compiled for the current study could facilitate validity testing of the current measurement instrument.

✦ Safe and unsafe behavior on the job.

✦ Accidents and injuries amongst SYEP workers during the study period (one summer).

✦ A qualitative analysis conducted to assess the feeling and perceptions of SYEP workers about the two training procedures and the organizational safety cultures of the three organizations.

### **Data Collection**

Data for this study will come from four sources:

✦ A test of basic safety knowledge will be given to each participant at the end of the safety training programs. Scores will be compared between the two groups and with scores generated in the previous two years. Statistical comparisons will be made using independent group *t*-tests.

✦ Safety-behavior skill observation sheets (see Geller, 2002) will be completed by trained observers (direct supervisors and researchers) at least once weekly for each research participant. Independent group *t*-tests will be used to look for statistical differences between groups. Approximately 20% of observations will be conducted by two observers to provide reliability data. Reliability calculations will be made using percentage agreement between the two observers (see Leedy & Ormrod, 2005).

✦ Accident and injury reports will be maintained by the temporary employment agency (a standard practice). These data will also be compared to accident and injury data collected during the previous two summers. Independent group *t*-tests will be used to compare group scores.

✦ At the completion of each safety training session, groups of participants will be asked to express their feelings and perceptions about the training they received (see O'Brien, 2000 and Peterson, 2001, as cited in Geller, 2005). These discussions will be unscripted and informal. At the end of each participant's employment with the SYEP, the participant will be asked to complete an exit interview, which includes a scripted one-on-one interview with the temporary agency's human resource director, and a perception survey. The perception survey has been used for several years and includes questions about organizational safety culture.

### **Research Participants**

Participants will be drawn from the SYEP workers employed over one summer. On average, 40 people are hired each year for this program. All people hired for the program will be informed that the temporary employment agency, and the supporting organizations, are participating in a research project designed to study workplace safety. All will be asked to volunteer to participate. Those who volunteer will be asked to sign a statement of informed consent to acknowledge that they (a) have been informed about the research study and (b) have consented to participate in the proposed research.

SYEP employees who volunteer for this Safety Training Research Project will be randomly assigned to one of two safety training conditions: (1) standard safety training, or (2) BST with *in situ* training. A "no-treatment" (no safety training) control group will not be used because each of the organizations is required by regulation to provide safety training to new employees and it would be unethical to fail to provide safety training.

All participants who complete their safety training will be given \$25. In addition, all participants who continue in the research project will receive an additional \$25 upon completing their exit interviews and surveys.

## **Method**

**Standard safety training program.** Currently, all prospective new employees (including SYEP workers) receive the same basic pre-employment safety training which is entirely classroom based, and consists of reading assignments and lectures supported by audio-visual aides such as video tapes and power point presentations. This training is conducted on two successive eight-hour days. At the end of the training, prospective employees are required to complete a 100-question written test that covers the safety topics included in the safety training. Trainees must score a minimum of 80% to be hired. Trainees who fail are permitted to retake the course one week later. Trainees who successfully complete the course

by scoring 80% or more on the written test, and accept employment, are given \$25 (though they are not yet employed by one of the organizations and are not otherwise paid). The only other measures of on-the-job safety are accident and injury reports filed by supervisors when they become aware of on-the-job accidents or injuries. These practices will continue as they have with the exception that safe and unsafe workplace behaviors will be recorded during planned observations which will be conducted at least once weekly for 30 minutes for each SYEP worker. Each participant hired into the SYEP will be required to perform each of the trained safety skills during his or her first day on the job. Safe and unsafe on-the-job behaviors will be observed and recorded but no praise, corrective feedback, or retraining will occur. Subsequent safety behavior observations will likewise result in no praise or corrective feedback.

**BST with *in situ* training.** Following typical practices for BST with *in situ* training (Himle, Miltenberger, Gathridge, & Flessner, 2004) and behavior-based safety and occupational risk management (Geller, 2002; 2005), prospective SYEP workers assigned to the BST with *in situ* training condition will receive safety training designed to cover all the topics covered in the standard safety training program but following a plan of instruction, modeling, rehearsal, and praise for correct behavior/corrective feedback for incorrect behavior. Trainees will not move on to subsequent lessons until they have successfully completed a required safety procedure rehearsal three consecutive times. Once trainees have completed all behavior skill training modules, they will be required to take and pass the 100 question safety test. Each participant hired into the SYEP will be required to perform each of the trained safety skills during his or her first day on the job. Safe and unsafe on-the-job behaviors will be observed and recorded. Safe behaviors will be praised. Unsafe behaviors will result in corrective feedback and retraining (*in situ* training). Subsequent safety behavior observations will result in no praise or corrective feedback.

## Discussion

This recommended research proposes an applied research project with the goal of determining whether a behavior-based safety skills training program will increase on-the-job safety behaviors and reduce accidents and injuries in young (16-19 year-old) workers as compared to the instruction-based training program now in use. Rejecting the null hypothesis based on data obtained from this study would extend the research base demonstrating the efficacy of behavior-based training programs in improving safety behaviors. In addition, it would extend the re-

search base demonstrating efficacious organizational training methods.

The proposed research has broader implications as well. Findings may be relevant to even younger workers, for example, young teenagers are often employed as farm and agriculture workers, and young people may work in family businesses. Research using BST and *in situ* training to teach safety skills to young children (Himle, Miltenberger, Flessner, & Gathridge, 2004; Miltenberger, et al., 2004) make this extension more plausible, but more research should be done with specific job-related safety skills in differently aged populations. Findings may also be relevant for adult workers, especially newer workers who have been shown to be more prone to accidents and injuries due to lack of experience (BLS, 2004a).

The proposed research has several clear limitations. Owing to ethical and legal concerns, no "no treatment" control group can be used. The sample sizes may be too small to yield meaningful results owing to a likely population size of about 40. However, since all SYEP workers are required to take safety training and the only additional requirement for participating in the proposed research would be to permit behavioral observations (with participants completing the project earning an additional \$25) it is expected that most SYEP candidates will volunteer.

Two methodological concerns limit the proposed research. *In vivo* behavioral observations may affect safety behaviors in the observed participants thereby artificially improving safety behavior in both groups (the "Hawthorne effect," Leedy & Ormrod, 2005). However, it is expected that any potential effect should apply to both groups equally. More problematic, however, is the fact that cross-contamination may occur both during *in situ* training sessions where standard training group participants may witness additional training being provided to BST group participants, and conversations and "safety instruction" may occur between participants from both groups (Leedy & Ormrod, 2005). However, comparisons between accident and injury data from research participants and SYEP workers from previous years may help determine the size of this effect, even though it is also possible that there have been substantial differences in the SYEP populations from year to year. However, current data show a relatively consistent accident and injury rate from year to year, possibly mitigating this concern.

This recommended research uses both quantitative and qualitative measures to capture a broad range of data about safety performance following standard and behavior-based trainings, and SYEP workers' feelings and perceptions of the training programs and organizational safety cultures. These data are expected to provide a useful guide to the administrations of the temporary employment agency and three organizations involved in the safety training and hiring of SYEP workers. The data are

expected to be important also to the broader community of organizational behavior managers, organizational development specialists, and safety engineers as they attempt to decide which safety training programs improve on-the-job safety behavior and reduce workplace accidents and injuries.✻

## Endnotes

The original version of this paper was completed as part of the requirements for a doctoral graduate course at Capella University. Address correspondence to the author at 5325 State Highway 37, Ogdensburg NY 13669.

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Each 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 2 (Fall 2004): BEHG 101:  
*Introduction to Behaviorology I.\**
- Volume 7, Number 2 (Fall 2004): BEHG 102:  
*Introduction to Behaviorology II.\**
- Volume 7, Number 2 (Fall 2004): BEHG 201:  
*Non-Coercive Child Rearing Principles and Practices.\**
- Volume 7, Number 2 (Fall 2004): BEHG 355:  
*Verbal Behavior I.\**
- Volume 8, Number 1 (Spring 2005): BEHG 400:  
*Behaviorological Rehabilitation.*
- Volume 8, Number 1 (Spring 2005): BEHG 415:  
*Basic Autism Intervention Methods.\**
- Volume 8, Number 1 (Spring 2005): BEHG 420:  
*Performance Management and Preventing Workplace Violence.\**
- Volume 8, Number 1 (Spring 2005): BEHG 425:  
*Non-Coercive Classroom Management and Preventing School Violence.\**
- Volume 8, Number 1 (Spring 2005): BEHG 475:  
*Verbal Behavior II.\**
- Volume 8, Number 2 (Fall 2005): BEHG 410:  
*Behaviorological Thanatology and Dignified Dying.*
- Volume 9, Number 1 (Spring 2006): BEHG 365:  
*Advanced Behaviorology I.*
- Volume 9, Number 2 (Fall 2006): BEHG 470:  
*Advanced Behaviorology II.*
- Volume 10, Number 1 (Spring 2007): BEHG 120:  
*Non-Coercive Companion Animal Behavior Training.*

### **Syllabi Planned for Future Issues**

- Volume ?, Number ? (Spring/Fall 20??): BEHG 250:  
*Educational Behaviorology for Education Consumers.*
- Volume ?, Number ? (Spring/Fall 20??): BEHG 340:  
*Educational Behaviorology for Education Providers.*
- Volume ?, Number ? (Spring/Fall 20??): BEHG 405:  
*Introduction to Instructional Practices in Educational Behaviorology.*

- Volume ?, Number ? (Spring/Fall 20??): BEHG 455:  
*Advanced Instructional Practices in Educational Behaviorology.*
- Volume ?, Number ? (Spring/Fall 20??): 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 10, Number 1 (Spring 2007).
- BEHG 201: *Non-Coercive Child Rearing Principles and Practices:*  
Volume 7, Number 2 (Fall 2004).
- BEHG 250: *Educational Behaviorology for Education Consumers:*  
Volume ?, Number ? (Spring/Fall 20??)
- BEHG 340: *Educational Behaviorology for Education Providers:*  
Volume ?, Number ? (Spring/Fall 20??)
- BEHG 355: *Verbal Behavior I:*  
Volume 7, Number 2 (Fall 2004).
- BEHG 365: *Advanced Behaviorology I:*  
Volume 9, Number 1 (Spring 2006).
- BEHG 400: *Behaviorological Rehabilitation:*  
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- BEHG 405: *Introduction to Instructional Practices in Educational Behaviorology:*  
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- BEHG 410: *Behaviorological Thanatology and Dignified Dying:*  
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- BEHG 425: *Non-Coercive Classroom Management and Preventing School Violence:*  
Volume 8, Number 1 (Spring 2005).
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## TIBIA Membership Criteria & Costs

TIBIA 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:

<u>Category</u>	<u>Dues (in US dollars)*</u>
<b>Board of Directors member</b>	The lesser of 0.6% of annual income, or \$120.00
<b>Faculty member</b>	The lesser of 0.5% of annual income, or \$100.00
<b>Advocate member</b>	The lesser of 0.4% of annual income, or \$80.00
<b>Associate member</b>	The lesser of 0.3% of annual income, or \$60.00
<b>Affiliate member</b>	The lesser of 0.2% of annual income, or \$40.00
<b>Student member</b>	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: \_\_\_\_\_

Member Category: \_\_\_\_\_

Office Address: \_\_\_\_\_

Amount enclosed: us\$ \_\_\_\_\_

\_\_\_\_\_

Home Address: \_\_\_\_\_

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Office Phone #: \_\_\_\_\_

Home Phone #: \_\_\_\_\_

FAX #: \_\_\_\_\_

CHECK PREFERRED MAILING ADDRESS:

E-mail: \_\_\_\_\_

Office:  Home:

Degree/Institution:\*\* \_\_\_\_\_

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\*

TIBI, 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.☺

## Periodical Information

*Behaviorology Today* [known as *TIBI News Time* for the first 4 volumes / 8 issues], is the magazine of *The International Behaviorology Institute* (a non-profit educational corporation) and is published in the spring and fall each year.

*Behaviorology Today* and TIBI can be contacted through the Editor at these addresses and web site:

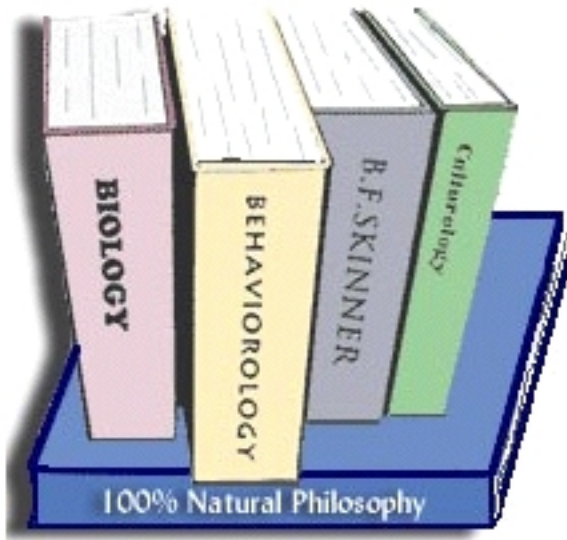
Dr. Stephen F. Ledoux, Editor  
Arts & Sciences  
State University of New York at Canton  
34 Cornell Drive  
Canton NY 13617-1096 USA  
Phone • Fax: (315) 386-7423 • 386-7961  
E-mail: ledoux@canton.edu  
www.behaviorology.org

To submit items for publication, contact the editor. Send items initially to the editor both by email (or disk) and by hard copy.

Authors' views need not coincide with official positions of TIBI. (Authors retain copyrights.)

\*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.



**SOME TIBI CONTACTS:**

**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

**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](http://www.canton.edu)

**Zuilma Gabriela Sigurdardóttir, Ph.D.**

(Member, TIBI Board of Directors)  
*Associate Professor, University of Iceland*  
zuilma@hi.is

***Behaviorology Today***

Prof. Stephen F. Ledoux, Editor  
SUNY at Canton  
34 Cornell Drive  
Canton NY 13617-1096 USA

