Contents

Note: Prior to Volume 16, Number 1 (Spring 2013) the Journal of Behaviorology went by the name of Behaviorology Today, which occasionally published fully peer-reviewed articles, explicitly so labeled. Beginning with Volume 15, Number 1, in January 2012, all material receives full peer review. See the “Submission Guidelines” for details.

Editorial

Changing Terms is Insufficient to Save our Science and Practice—A Response to the Special Section on the term Behavioral Materialism
Stephen F. Ledoux

Syllabus Directory*

Alexandr A. Fedorov

Table of Contents for the Book, About Science, Life, and Reality, by Lawrence Fraley
(Assembled by Stephen Ledoux)

Editorial Review Board & Guest Reviewers / Back Issues & Donations

Visit www.behaviorology.org / Journal & Website Copyrights

Submission Guidelines

TIBIA Memberships Costs & Criteria & Benefits

TIBIA Membership Cost Details (and Application Form)

TIBI / TIBIA Purposes

About Behaviorology, TIBI, and Journal of Behaviorology

Some TIBI Board Member Contacts

* This issue does not contain any new or updated TIBI course syllabi. New syllabi, or updates of previous syllabi, may appear in future issues. (See the Syllabus Directory for details.)
This issue of the Journal of Behaviorology consists of two articles. The first article, “Changing terms is insufficient to save our science and practice—A response to the Special Section on the term Behavioral Materialism,” by Stephen F. Ledoux, is an excellent contribution to the Special Section that appeared in the last issue (Volume 22, Number 1–2) on the term radical behaviorism and Joe Morrow’s proposal for an alternative name, behavioral materialism. After reading all of the articles in that Special Section, and Ledoux’s article in the current issue, I am personally persuaded of the alternative “behavioral naturalism.” I am also persuaded that a new name would benefit the future of our science.

The word “radical” has come to evoke a completely different set of responses than it would have when it was first used in the label, “radical behaviorism,” and in the already conditioned repertoires of disciplinary members. Getting those repertoires, however, always required some extra, explicit conditioning with students, and the public, when the term, “radical behaviorism,” was used with them. That kind of distracting clarification, when the term is used or taught, is a confusing educational inefficiency. This article, however, should not be the last word. Other contributions to this discussion in issues to come would be welcomed augment to the topic.

The second article, by Alexandr A. Fedorov, has the title, “Publishing about autism spectrum disorder in the Journal of Applied Behavior Analysis and the Journal of the Experimental Analysis of Behavior: Bibliometric analysis (1958–2017).” This article addresses the broad range of research on autism spectrum disorder (ASD), a topic of interest to many behavior analysts and behaviorologists. The vast majority of the analyzed studies appeared across the pages of the two prominent behavior–science journals named in the title. An important conclusion involved the schism between basic and applied research and publishing as reported mostly with respect to ASD research.

One last new item in this issue provides readers with the Table of Contents for Lawrence Fraley’s new book, About Science, Life, and Reality. This soft–cover, 214–page book breaks new ground by clarifying and connecting the elements of the book’s title, science, life, and reality. The book begins with some details about the imminently needed steps, by traditional natural scientists, to integrate behaviorology courses, programs, and departments into their natural–science units at colleges and universities to enable its practitioners to supply the culture with fully scientific solutions to the behavior components of global—and individual and local—problems. The book then proceeds to describe and resolve some of the difficulties faced by that task. These difficulties begin with the culture’s long–standing intellectual error of accepting pre–scientific—and today, unscientific—accounts for behavioral and other phenomena. These difficulties even extend to misconceptions of reality, with Fraley describing a more scientifically accurate conception of reality. Every applied behaviorologist, every BCBA, indeed every person, interested in understanding behavior and reality better, will find much of value in this book.
Changing Terms is Insufficient to Save Our Science and Practice—A response to the Special Section on the term Behavioral Materialism

Stephen F. Ledoux*

Abstract: For decades the label “Radical Behaviorism” has named the philosophy of science of behaviorology as an extension of Naturalism, the general philosophy of science of the natural sciences. Substituting the label “Behavioral Materialism” for the label “Radical Behaviorism” would end some continuing difficulties that have reduced efficient dissemination of information in public and educational settings. Yet for people outside philosophy, the “Behavioral Materialism” label could create the new difficulty of confusion over the meaning of “materialism.” Science cannot leave anyone behind, because all must help solve global problems. A label, like “Behavioral Naturalism,” that ends the same difficulties that the “Behavioral Materialism” label ends, but without creating a new one, would help, and also carries the connection with the natural sciences and their general philosophy of science. This, along with other efforts, could, and must, help save our science and practice, if we, under any name, are to help solve global problems.

When the editor of the Journal of Behaviorology accepted the suggestion, one that Traci Cihon and I made, for a Special Section of commentaries discussing Joseph Morrow’s Behavioral Materialism paper (2019), I recused myself both from any initial commentary contribution and from reviewing manuscripts directly addressing his paper, because Dr. Morrow had served most effectively, in the early 1970s, as my undergraduate mentor and as my MA thesis advisor. Making this “In Response” contribution in a subsequent journal issue, however, seems reasonable. The commentary papers in the Special Section, in their order of appearance, were Fedorov, 2019; Critchfield & Epting, 2019; Morris, 2019; Fraley, 2019; and Ferreira, 2019.

Professor Morrow’s paper describes various difficulties that adhere to the label “Radical Behaviorism” every time it is used, especially with new listeners or readers, in both public and educational settings. Time and energy must then go into addressing these difficulties, clarifying and explaining them, if the audience has not already simply “left the room,” put off by its misunderstanding of both words “radical” and “behaviorism.” For the lost audience as well as the audiences that remain, such efforts necessarily reduce the efficiency of education and dissemination. Current global problems, however, have established a shrinking time frame in which to solve these problems before their worst effects overtake humanity (Thompson, 2010). As Marshall McLuhan pointed out, “There are no passengers on spaceship Earth; we are all crew” (see Worth, 2019, p. 17).

That shrinking time-frame contingency, however, necessitates increasing education and dissemination efficiencies. Even when the efforts seem small, like changing from a less helpful label to a more helpful label naming a philosophy of science, any efforts to increase the associated efficiencies deserve encouragement. Of course,

*Address correspondence regarding this paper to ledoux@canton.edu.

Agents (like “I”) and agential selves (like “myself”) are irrelevant to dealing with behavior. Until a new grammar (see Ledoux, 2014) widely controls verbal behavior, however, such terms typify a range of standard verbal shortcuts, familiar to behaviorology–discipline readers as verbal shortcuts, that appear in this (and many) articles to move the content along rather than bog it down in already—understood, long—winded technicalities, which would greatly reduce readability. This concern similarly extends to other verbal shortcuts such as descriptions of contingencies as “on” individuals or groups even though contingencies really only operate on behavior.

Key words: Philosophy of science, naturalism, behaviorism, radical behaviorism, behavioral materialism, behavioral naturalism, behaviorology, The Experimental Analysis of Behavior (teab), Applied Behavior Analysis (aba), natural science, contingency engineering
larger efforts also deserve encouragement, including efforts to put the natural science of behavior and its contingency engineering into the mainstream, supported by as many natural scientists of behavior as possible, who go by a couple of different disciplinary names.

Professor Morrow's paper also persuasively describes his proposal that the "Behavioral Materialism" label can put an end to many of the problems that adhere to the "Radical Behaviorism" label; his paper should be read as much for the details of these problems as for the details of his solution (so, few such details get repeated here). While less problematic than the "Radical Behaviorism" label, the "Behavioral Materialism" label is not fully helpful if it brings with it problems of its own. For example, while Morris (2019) discusses some problems, here is another. Outside philosophy circles many people remain uninformed about the philosophical meaning of the term "materialism" as referring to the opposite of "idealism" (the philosophical meaning of which many people also misunderstand). Indeed, many people, including those in other disciplines and fields along with clients, consumers, and students, respond to the term "materialism" by equating it with "possession of material goods," a notion commonly arising from some contingencies at work in the generally pre--scientific, traditional cultural conditioning of unquestioned childhood upbringing. This misunderstanding survives, leaving little reason to hunt for other meanings.

Can a different label solve the other problems that the "Behavioral Materialism" label solves and avoid this one as well? Such a label could be well placed to increase education and dissemination efficiencies. And, as Critchfield and Epting (2019) ask in different words, what contingencies can bring about the widespread use of new terms and, by implication, further support mainstreaming the natural science of behavior and its contingency engineering (i.e., our science and practice)?

Similarly, what contingencies can bring about the even greater changes needed to help solve global problems, especially those with behavior components in the problems and the solutions? These need our time and energy and effort. If the involved scientists find such questions daunting, and back away from trying, others may retreat also, which is unhelpful for everyone. Instead we need a range of new responses. Whether these new responses involve just adopting relatively "little" new terms, or involve adopting relatively "big" new cultural practices, is not the point, because either one may help the other. Let the new responses flow. As we work with the contingencies and their functional control of behavior, some new responses will predictably get selected.

**About New Terms**

Regarding the question of adopting new terms in general, some experience has already accumulated. Over recent decades lots of new terms have ended problems with older terms. Some of these include (a) the terms "added" and "subtracted" reinforcement and punishment replacing the terms "positive" and "negative" reinforcement and punishment (see Ledoux, 2015, pp. 199–204); (b) the term "coincidental" reinforcement replacing the term "accidental" reinforcement (see Ledoux, 2014, Chapter 11); (c) the terms "evocation" and "evocative" replacing the terms "discrimination" and "discriminative" (see Ledoux, 2014, Chapter 12); (d) the term "behaviorology" replacing the term "behavior analysis," which was replacing the term "The Experimental Analysis of Behavior" (TEAB; see Fraley & Ledoux, 2015); and (e) the term "contingency engineering" (the applied part of behaviorology, the largest area of which is commonly known as Applied Behavior Analysis: ABA) replacing the term "behavior engineering" which was replacing the term "behavior modification" (various authors, and discussed in Ledoux, 2014, 2017).

Looking more closely at that last change in terms (i.e., about changing from "behavior modification" to "behavior engineering" to "contingency engineering") can also show how interconnected improving terms might be with bigger concerns like solving global problems. Many professionals stopped using the term "behavior modification," due to bad press about the word "modification." Another reason, however, exists for dropping this term. And this reason also applies to why the term "behavior engineering" is an inadequate alternative. Due to the contingencies in their traditional cultural conditioning, people in general respond negatively, particularly with negative, respondently conditioned emotional responses, to modifying—or manipulating, or controlling, or engineering—behavior. Meanwhile, the responses to modifying—or manipulating, or controlling, or engineering— independent variables, and environments, and even contingencies, are far more neutral.

Now, with those more neutral responses in hand—neutral responses to engineering independent variables, environments, and contingencies—consider the facts about the activities of natural scientists and engineers who study behavior. They do not actually—as in directly—modify or manipulate or change or control or engineer behavior. For these two reasons (i.e., the negative emotional reactions against "modify [etc."]) and the fact that scientists and engineers who study behavior do not directly “change [etc.]” behavior) much confusion, misunderstanding, and objection arises when these scientists and engineers claim or even imply that
they do so, by using these older terms. Instead their engineering efforts and interventions and practices all focus on changing the environment, on changing the contingencies, on changing the functional relationships—between independent variables and behavior—that determine behavior.

In setting aside the “behavior engineering” term, natural scientists of behavior could not, without also causing unnecessary confusion, use the term “environmental engineering,” because others, grounded in other sciences, were already using this term for a different field. That is partly why some in the natural science of behavior, behaviorology, and its engineers have begun to use the term “contingency engineering” (e.g., Ledoux, 2014, 2017). This engineering changes contingencies that then generate and shape and maintain behaviors that garner the support of individuals and society. Some contingency-engineering areas of behaviorology include its ABA areas of parenting, regular and special education, behavioral medicine, green contingency engineering, dignified dying, companion animal training, behavioral safety, business and organizational management, penal rehabilitation, and autism and developmental disabilities interventions, among others (Ledoux, 2019).

**Objections and Interconnections**

Some people object to that list of contingency-engineering areas, because it seems to them as merely a kind of claim-staking exercise. Others object to some people’s policy of trying to make behaviorology go away by telling impressionable students to ignore whatever anyone says if they use the term “behaviorology,” a policy that also looks like a kind of claim-staking exercise. Such extinction policies have failed while ABA areas continue to derive from the natural science that Skinner started in the 1930s, a name for which is behaviorology, a name which is here to stay. But time spent arguing such issues is time wasted in terms of helping solve global problems, because if mutual attempts at response extinction by associated professionals succeed in dictating the reduction of further efforts, then success gets reduced, even precluded, for everyone.

Those concerns exemplify how everything is interconnected. Solving global problems is in some vital ways connected to bringing the natural science of behavior and its contingency engineering into the mainstream, which is in some ways connected to adopting more appropriate terms that cause fewer difficulties and so lead to education and dissemination efficiencies, which are now needed more than ever. So, back to the terminology concerns.

As mentioned, the term “Behavioral Materialism” solves a bunch of problems, yet it also introduces the new one regarding misunderstandings over the word “materialism.” This term poses few problems for philosophers, one of the major audiences for Morrow’s proposal. The contingencies on philosophers regularly compel them to deal with the philosophical connotations of the term “materialism.” The contingencies on many members of the general public, however, leave them confronting mostly the “possession of material goods” connotation of the term “materialism,” a connotation typically found objectionable.

That raises a question. Can we find a term that can replace the label “Radical Behaviorism” while solving all the problems with it that the suggested replacement term “Behavioral Materialism” solves, but that does not create any new problems?

In answer, here is one possibility; perhaps it also creates new problems. Given that “Naturalism” continues as a common label tacting the general philosophy of science of the natural sciences including behaviorology, perhaps the label “Behavioral Naturalism” would make a reasonable replacement for the label “Radical Behaviorism,” for the same or similar reason, and solving mostly the same or similar problems, as Morrow discussed for the “Behavioral Materialism” label. The label “Behavioral Naturalism” explicitly connects our philosophy of science, the philosophy of science of the natural science of behavior, to Naturalism, the philosophy of science of the natural sciences. And explicitly acknowledging this connection remains appropriate because, after all, our philosophy of science is an extension of the Naturalism of the natural sciences (Ledoux, 2019).

**Larger-Scale Problems**

Larger problems, however, remain. Even before solutions to global problems come before us for consideration, Critchfield and Epting (2019) raised other problems. These concern how, successfully, to change terms and, even more importantly, how to improve the prospects for our science and practice. To begin answering, a return to the implications of our scientific roots seems appropriate.

The process of changing to any and all of those mentioned newer terms, including “Behavioral Materialism” or “Behavioral Naturalism,” involved and involves the occurrence of these terms, consistently and continually (unless something even better comes along) while the contingencies that build history decide on the staying power of the terms. Of course, traditional agential phrasing would speak of “using” these terms, while scientific readers respond to “using” as a well-understood verbal shortcut. More importantly, adopting those terms works better when done from within a clear program for disciplinary—science and practice—improvement, such as behaviorologists pursue with respect to maintaining (and perhaps even growing) a natural science of behavior.
that (a) stands as the fourth basic science subject matter at the roundtable of natural sciences (i.e., energy, matter, life, behavior as subject matters of physics, chemistry, biology, and behaviorology respectively; Fraley, 2019), and (b) remains aligned in science and philosophy with other natural sciences, while also separate from and independent of any disciplinary connections or shared history with fundamentally non–natural disciplines (e.g., psychology; Fraley & Ledoux, 2015).

That program for disciplinary improvement and mainstreaming is particularly important now, because traditional natural scientists, recognizing both that human behavior causes most global problems, and that humanity needs changes in human behavior to solve those problems, have called for a natural science of human behavior (e.g., McIntyre, 2006). Without knowing that such a science has existed for 100 years (Ledoux, 2012), these traditional natural scientists (e.g., physicists, chemists, biologists) also recognize that this circumstance means that a natural science of human behavior is required if humanity is to solve its global problems in the timely manner that the problems and their outcomes impose.

So it behooves all natural scientists of behavior, under whatever name, including the few remaining in our laboratories and the many in our various contingency–engineering areas, to do their share supporting all efforts that bring us together with each other and with our traditional natural–science colleagues for enhanced mutual understanding and collaboration. Such enhancements will support our science and practice by helping establish departments and programs of our natural science of behaviorology (e.g., in green contingency–engineering programs; see Ledoux, 2018a) that increase our share in supporting all natural sciences in the efforts to solve global problems (i.e., see Chapter 27 of Ledoux, 2017; also see Ledoux, 2018b, for shared experiences in developing courses and programs in the natural science of behavior). Otherwise, the unmitigated outcomes of our current global problems will likely make all of these discussions rather meaningless (Thompson, 2010).

Intermediate Concerns

Still, the question that Critchfield and Epting (2019) very reasonably raised, about how to get a replacement term to take hold, remains. The answer presumably resides in the discipline of disciplinary contingencies. Cannot everyone involved in the natural science of behavior, and in the contingency engineering to which it leads (under whatever disciplinary labels) find or design and engage in steps that help adjust the contingencies that improve terminology–related behaviors? Can this not be one of our interventions? Is this a daunting task? Are we not all under the additional, even longer–range, culture–future determining contingencies that must induce many behaviors, including these, relevant to improving and extending our science and practice?

Just for starters, we all benefit when everyone in the natural science of behavior, and its contingency–engineering areas, examines the written reference resources regarding all the new terms (as well as the accumulation of other historical disciplinary developments in our science and practice) and then employ these terms. We can employ them regularly and continually, with all audiences, and experience the reactions and feedback from listeners, and maybe even report some of the reactions and feedback to others across these fields. Perhaps the reactions of philosophers will support the “Behavioral Materialism” label. Perhaps the reactions of traditional natural scientists will encourage the “Behavioral Naturalism” label. Perhaps the experience of trying will show us that we can accomplish so much more by applying our own science and practice to these problems. And that is a step to saving our science and practice as well.

We are all under contingencies to improve and extend our science and practice. Perhaps some help for all will occur from at least some data accruing from the smaller effort needed to adopt new terms. Perhaps the biggest factor will involve the biggest audiences with whom natural scientists of behavior and contingency engineers interact the most. Perhaps philosophers will constitute most of the audience, with the biggest impact. Then maybe the “Behavioral Materialism” label will become the best replacement term for the “Radical Behaviorism” label. Papers in the Special Section in the last issue of this journal have addressed this relation. Or, perhaps the combination of service clients and consumers plus students and other natural scientists will prove a bigger audience, with the biggest impact. Then maybe the “Behavioral Naturalism” label will become the best replacement term for the “Radical Behaviorism” label. Maybe helping solve global problems will become even more important than personal preferences about terms or science and practice. This might even lead to not changing terms now. Or maybe some other term might arise that proves even better that either of these two. Perhaps just the ongoing and evolving discussion provides benefits. However, humanity is running out of time.

An Expansive Review

To the extent that contingency engineers interacting with clients or consumers—or professors interacting with students—need to discuss philosophy of science, the term “Behavioral Naturalism” seems a simpler term that may prove more successful in those discussions. Similarly, when natural scientists of behavior interact
with traditional natural scientists, which is currently particularly necessary regarding the share of contributions from our discipline needed to help solve global problems, then again, the term “Behavioral Naturalism” may prove more successful in those interactions, to the extent, again, that interactions with other natural scientists need to consider philosophy of science (e.g., Ledoux, 2019). And behaviorology has far more to contribute that benefits traditional natural scientists than just philosophical discussions (e.g., see Ledoux, 2017, pp. 371–392).

In elaborating a review, consider that everyone involved in behavior science and practice, under any name, probably produces benefits by considering and engaging all three terms that are the focus of this discussion (i.e., “Radical Behaviorism,” “Behavioral Materialism,” and “Behavioral Naturalism”) along with any additional worthy alternatives that arise, while noting and reporting the contingent reactions. Predictably a lot of additional and valuable contingency development will also derive from this activity. This applies to all these terms, and the other new terms already mentioned. We can all work them in at every opportunity (e.g., in conversations, discussions, lectures, reports, and writings). And let the operating contingencies select from among the alternatives which ones are appropriate and which are inappropriate.

Such activity and other activities are interrelated. We all benefit by engaging in these activities while helping solve individual and local problems of various consumers and clients, and while interacting with students whose contingencies compel seeking this science and engineering in courses, programs, and departments, as well as while actively helping solve global problems. We all benefit by establishing—in college and university natural–science units, possibly starting in biology departments—additional general disciplinary undergraduate programs in our natural science, programs that cover not just the principles, methods, and concepts needed for decent contingency–engineering interventions with clients and consumers, but also programs that cover the extensions, implications, and interpretations in the basic science. Various chapters elaborate many of these basic–science extensions, implications, and interpretations, for example, chapters in Fraley, 2008 (for doctoral students) and in Ledoux, 2014 and 2017. And, based on these foundations, we can add graduate programs in experimental behaviorology (to rebuild our professorial research laboratories) along with graduate programs in our contingency–engineering areas of ABA. By first studying the science thoroughly, with its extensions, implications, and interpretations, students in these programs would then be more thoroughly and appropriately prepared and qualified to study the engineering interventions, which would help our science and practice by raising the respect for our applied interventionists, and improving our interdisciplinary relationships.

Has not the time come for our disciplinary engineers to have the same level of grasp of the full extent of their basic science (including its extensions, implications, and interpretations) that other engineers, in other fields, have of theirs? This is quite different from receiving only enough basic–science instruction to enable using an intervention cookbook (at an undergraduate level) or enough to pass a certification exam (at a graduate level). Such a scenario, if it happens even once, is happening too often. Does that scenario describe any current applied programs? Should not our professional education be completed to higher levels than just what is legally needed to pass exams? True, the difficulties multiply when ABA programs inappropriately exist in psychology departments where any interest must officially and realistically lag regarding committing resources to these programs. For example, more of the courses required of students in these programs would have to be natural science of behavior courses rather than psychology courses, a pattern about which very few if any psychologists could be enthusiastic. And they are right; such courses and programs don’t belong in psychology departments but in independent behaviorology departments in college and university natural–science schools.

That, however, simply reminds us that our natural science of behavior is not a part of, nor any kind of, psychology. Indeed it never really was a part of psychology, as natural scientists of behavior, from Skinner on, were always under natural–science contingencies, involving philosophy of science concerns, that disallowed buying into any part of the range of inner–agent causes of behavior that remain a required part of the psychology discipline. The psychology discipline officially discards our natural–science approach of both experimental methods and philosophies of Naturalism and Behavioral Naturalism; the result of buying into any two, let alone all three, of these would just not be psychology! It would be a different discipline. Similarly, philosophers did not want experimental methods in philosophy. That just would no longer be philosophy; it would be a different discipline. Those who wanted such methods had to start their own discipline, namely psychology. For many decades now, psychologists have kicked us out for wanting strictly natural science and philosophy, telling us that the result would not be psychology but would be a different discipline. So those who wanted strictly natural science and philosophy had to move our own discipline officially and completely out of psychology. Some of us took this action back in 1987 (see Fraley & Ledoux, 2015, for details). Meanwhile, psychology continues to claim the “behavior analysis” label; an “etic” reason (Harris,
1979) could be that this term endows some (uncleared) natural–science credibility.

For many natural scientists of behavior who are stuck in a psychology department, that can be a hard pill to swallow, even if you are personally successful in those circumstances. But for most people, and for our science and practice in general, trying to make “changing psychology” work has failed for over 100 years. This is data. As natural scientists, data controls our behavior. The involved contingencies are complicated (see Fraley & Ledoux, 2015). And for the sake of our share in helping humanity, especially in solving global problems, the contingencies are inducing the finding of ways to make our decades of separation and independence from psychology even more successful.

So should not we all be endorsing—and putting up with the temporary disadvantages of—that independence movement, a movement that the behaviorologists officially began for everyone back in 1987 (see Fraley & Ledoux, 2015). While the professionals working under the behaviorology label have made some contributions to the world, they have not yet brought about big changes. Yet the same applies to those natural scientists who cling to psychology or to the “behavior analysis” label, and disdain the behaviorology label and the independence it signifies. So, yes, both groups have made some changes to the world. Perhaps chief among these could be that this ‘natural science of behavior” not need to be reinvented again.

**Conclusion**

In conclusion, the contingencies surrounding my own introduction to Radical Behaviorism, decades ago, have left me feeling personally quite comfortable with this label. While the same might describe the experience of many current natural scientists and contingency engineers of behavior, fifty years of experiencing the difficulty of teaching or explaining Radical Behaviorism to others, in diverse circumstances (e.g., courses or consultations) speak loudly to the need for, and benefits of, an alternative label. One gets tired of being stalled early in a description of Radical Behaviorism—and so maybe never getting to the helpful points about it—due to the need to explain not only behaviorism (to which contingencies have usually conditioned many inaccurate reactions) but also that “radical” means thoroughgoing or fundamental or comprehensive (or something even more complicated) rather than extreme (in the usual negative connotation). Any of these alternative labels would avoid that and, in doing so, seem better than retaining the many problems that the “Radical Behaviorism” label continues to have, even if it did not start out trying to have them.

My verbal behavior remains under two contingencies in particular that induce the frequent occurrence of the “Behavioral Naturalism” label. One involves the punishing contingency of having to explain “materialism,” (and de–condition the negative response to it) when using the “Behavioral Materialism” label with some audiences before getting to the helpful points of this philosophy of science. The other involves, in my work with other natural scientists, the reinforcing contingency that their ready familiarity with “Naturalism” helps with using the “Behavioral Naturalism” label, because “Naturalism” is the common name of their general philosophy of science, which allows getting right into the helpful points that our philosophy of science provides. I should have referred to Behavioral Naturalism in my “Ten commandments of natural science” paper (Ledoux, 2019) but the contingencies that first induced the “Behavioral Naturalism” label to occur in my repertoire were not operating until after the discussion arose, through the appearance of the papers in the Special Section, of a possible new label to replace the “Radical Behaviorism” label.

That has lessons for us all. The contingencies your behavior is under may induce the more frequent occurrence of one label as compared to the others. But the point is to expose these labels through their occurrence and so discover what the contingencies are inducing. History will do the rest.

**References**


---

Behaviorology can stand on its own references. Those references, however, make clear that they “stand on the shoulders of giants,” as the saying goes, as in giant repertoires and the contingencies that produced them (e.g., the contingencies and repertoires of Darwin, Skinner, Moore, Day, Michael, and so many more). When a group of natural scientists of behavior adopted the label “behaviorology” as the name for their decades–old discipline in 1987, several—including the present author—pledged most of their future writing output to building the explicit disciplinary literature of behaviorology (i.e., works by behaviorologists about behaviorology in behaviorology journals and books). The works in this literature get appropriately cited first, even when many other works are also worthy of citation for the same points. Hence this reference list contains mostly works from the explicit disciplinary literature of behaviorology. In many articles like this one, that means that some authors may seem over represented in the references, yet that happens simply because they have contributed their works to this literature.


Syllabus Directory*

The most recent issue of Journal of Behaviorology that features a Syllabus Directory contains two lists of TIBI’s current course syllabi. These lists show where to find the most up-to-date versions of these syllabi in number, title, and content. The first list organizes the syllabi by numerical course number. The second list organizes the syllabi by the chronological volume, number, and pages where you can find each course syllabus.

Each of these syllabi contain only information explicit to a particular course. You will find all the relevant generic information in the article, General Parameters & Procedures for Courses from The International Behaviorology Institute, in Journal of Behaviorology, Volume 18, Number 2 (Spring, 2015) pp. 3–6.

Current Syllabi by Course Number

**BEHG 100:** Child Rearing Principles and Practices; Volume 19, Number 2 (Fall 2016) 3–5.

**BEHG 110:** Introduction to Behaviorology Terminology; Volume 20, Number 1 (Spring, 2017) 19–21.

**BEHG 210:** Introduction to Behaviorology I; Volume 19, Number 2 (Fall 2016) 6–8.

**BEHG 211:** Introduction to Behaviorology II; Volume 19, Number 2 (Fall 2016) 9–12.

**BEHG 330:** Companion Animal Training; Volume 19, Number 2 (Fall 2016) 13–15.

**BEHG 340:** Introduction to Verbal Behavior; Volume 19, Number 2 (Fall 2016) 16–18.

**BEHG 350:** Behaviorology Philosophy and History; Volume 20, Number 1 (Spring, 2017) 22–24.

**BEHG 405:** Basic Autism Intervention Methods; Volume 19, Number 2 (Fall 2016) 19–21.

**BEHG 425:** Classroom Management and Preventing School Violence; Volume 19, Number 2 (Fall 2016) 22–24.

**BEHG 430:** Resolving Problem Animal Behavior; Volume 20, Number 1 (Spring, 2017) 25–28.

**BEHG 435:** Performance Management and Preventing Workplace Violence; Volume 19, Number 2 (Fall 2016) 25–27.

**BEHG 455:** Behaviorological Thanatology and Dignified Dying; Volume 19, Number 2 (Fall 2016) 28–31.

**BEHG 465:** Behaviorological Rehabilitation; Volume 19, Number 2 (Fall 2016) 32–34.

**BEHG 480:** Green Contingency Engineering; Volume 20, Number 1 (Spring, 2017) 29–31.

**BEHG 512:** Advanced Behaviorology I; Volume 19, Number 2 (Fall 2016) 35–37.

**BEHG 513:** Advanced Behaviorology II; Volume 19, Number 2 (Fall 2016) 38–40.

**BEHG 541:** Advanced Verbal Behavior; Volume 19, Number 2 (Fall 2016) 41–43.

---

*All of these TIBI course syllabi were either updated in 2016 or new in 2017. Many have older version appearing in earlier issues under different course numbers; see the Syllabus Directory in Volume 18, Number 1 (Spring 2015) for details.

Alexandr A. Fedorov*
Novosibirsk State University

Abstract: The article analyzes publications about autism in the leading behavioristic journals—the Journal of Applied Behavior Analysis (JABA) and the Journal of the Experimental Analysis of Behavior (JEAB). In total, 7,211 publications published between 1958 and 2017 were identified in Scopus. 597 of them contain terms (in the title, abstract, and/or in the author’s key words) which were used as search topics: “autism,” “autistic,” “Asperger syndrome,” and “pervasive developmental disorder.” It was shown that the vast majority of articles concerning autism are published in the JABA (98%). The dynamics of publications including cumulative curves are explored. Six thematic clusters in the field of studying autism are highlighted by constructing the terms map based on keyword analysis. The practice of co-citation is analyzed. The results would suggest that there is the essential schism between experimental and applied research on autism within the framework of behavior analysis.

According to the data provided in the STM report for 2015, more than 2.5 million scientific articles are published annually, and this number increases every year approximately by 3% (Ware & Mabe, 2015). This trend makes analytical surveys more relevant because they allow to present publications in a specific field of knowledge in a structured manner. One of the most effective methods for constructing such surveys is bibliometric analysis, which makes it possible to create a “map” of a particular field of scientific research on the basis of quantitative data. In this article, bibliometric analysis is applied to the publications about autism published in the leading behavioristic journals—the Journal of the

* Institute of Medicine and Psychology, Novosibirsk State University
The research was supported by the Russian Foundation of Basic Research (RFBR), the scientific project No. 18-013-00925.
Correspondence concerning this article should be addressed to: Alexandr A. Fedorov
Institute of Medicine and Psychology, Novosibirsk State University
1 Pirogov Str., Novosibirsk 630090
Russian Federation
Contact: fedleks@yandex.ru

The Russian–language version of this article is published in “Reflexio” (2018, vol. 11, № 2).

Keywords: autism, behavior analysis, bibliometric analysis, experimental science, applied science.
applied behavior analysis (ABA) has also received a great deal of attention, and has arguably yielded the most promising results of any research area to date” (Matson et al., 2012, p. 144). As mentioned above, this research is limited to two leading behavioristic scientific journals—the Journal of the Experimental Analysis of Behavior and the Journal of Applied Behavior Analysis. According to Scimago Journal Rank (SJR), these journals have the impact factors among the journals in the field of behavior analysis. The JEB impact factor for 2016 is 0.941, and the JABA impact factor is 0.587. The third is the Behavior Analyst with an impact factor of 0.376. Thus, the analysis of publications in JEB and JABA, which are not only the most ranked but also the most prestigious journals in the field of respectively experimental and applied analysis of behavior (Austin & Carr, 2000) can provide an adequate picture of studies of autism spectrum disorders within the behavioristic approach.

**Methods**

The data for this study were retrieved from the Scopus database which was chosen after comparison with Web of Science. It should be noted that none of these bases can claim the perfect representation of the publications within the scope of this research. For example, some articles on autism are included in Web of Science Core Collection without abstracts and keywords and, therefore, can be missed during the compilation of the information base if their titles do not include a direct indication of the ASD. At the same time the Scopus database is also not free from inaccuracies. In general, in the context of this research, Scopus has the following advantage. When searching for articles in Web of Science, Keywords Plus are used in addition to Author Keywords. Keywords Plus are extracted by an automatic computer algorithm that analyzes the titles of an article’s references. These Keywords Plus may include terms that are not included in the list of Author Keywords, as well as those that do not appear in the title or the abstract of the article. The representativeness of this parameter remains controversial and, consequently, the compilation of information using Web of Science may lead to the inclusion of irrelevant articles in it.

The terms “autism,” “autistic,” “Asperger syndrome,” and “pervasive developmental disorder,” with the logical operator of “or,” were used as search words. These terms were identified in the article title, the abstract, and/or in the keywords of the publications. The search period was set from 1958 to 2017. Also, in the field “source title,” the search was limited by two sources—the Journal of Applied Behavior Analysis and the Journal of the Experimental Analysis of Behavior. Initially all types of publications were retrieved. In total, 597 publications meeting these criteria were identified, the majority being articles (n = 584). The remaining 13 documents are scientific reviews, so they were also taken into account in further research.

The free software tool Vosviewer, version 1.6.7 (van Eck & Waltman, 2010) was used to analyze and visualize relationships between terms and co-citations. Vosviewer allows to construct bibliometric networks based on citation, co-occurrence of keywords, and other parameters. In these maps the size of the circles and the font of the label represents the number of occurrence, and the distance between two circles indicates the relatedness between them. The color of the circle is determined by the cluster to which it belongs. As developers of this software note, the VOS (Visualization Of Similarities) mapping method produces better structured maps than multidimensional scaling, another popular technique of bibliometric analysis (van Eck & Waltman, 2010).

**Results and Discussion**

**Trends with Time**

Figure 1 shows that there is the stable time trend of growth in the number of publications about autism. It is essential that this trend is connected exclusively with the Journal of Applied Behavior Analysis (JABA). For the entire period of the existence of the Journal of the Experimental Analysis of Behavior (JEB; i.e., from 1958 to 2017), only 11 publications on autism were published, with a maximum number of annual publications not exceeding two. Most of the publications (8 of 11) fall in 2007–2017. Thus, 98% of autism studies within the framework

---

2 The paper “Suppression of self-stimulation—three alternative strategies” (Harris & Wolchik, 1979) would be an example. Its subjects are four boys with autistic-like behavior.

3 For example, the article “Relationship of self-stimulation to learning in autistic children” (Koegel & Covert, 1972) is not indexed in Scopus.

4 Example, the article “Reinforcement frequency and restricted stimulus control” (Dube & McLvane, 1997) is included in the search results when the word autism is used as a search topic. Three individuals with moderate to severe mental retardation are studied in this article, and autism is not mentioned in the text at all. But references include articles that contain the term “autism,” so this term was included in Keywords Plus.
of the behavioristic paradigm (586 of 597) refer to applied behavior analysis. The distribution of publications for the five–year periods is given in Table 1.

As can be seen from the data given in Table 1, not only the absolute number of publications about autism increases in time, but also their relative number, especially in the last 15 years. Thus, for 2013–2017 years, the percentage of publications related to the study of ASD was almost 44% in JABA. Moreover, the share of similar publications in JEAB is also growing slowly: if prior to the beginning of the 2000s it fluctuated around 6%, then for 2013–2017 it increased to 1.5%.

Another interesting general trend is the change of the leader: before 1992 most of the articles appeared in the field of fundamental science, (i.e., the experimental analysis of behavior [JEAB]), but from 1993 articles in the field of applied science (JABA) began to prevail.

Term Analysis

Considering that the overwhelming number of articles included in the research base was published in the Journal of Applied Behavior Analysis, a term map was constructed only for this journal. The vosviewer software was used to analyze and visualize the terms. We determined for each pair of Author keywords the co–occurrence frequency with a threshold of seven. Terms with a general meaning, as well as those designating autism spectrum disorders directly were not included, because the very compilation of the information base of the research delineates the subject area. The list of excluded words is autism, autistic children, developmental disabilities, autism spectrum disorder, children, and Asperger syndrome. Singular and plural forms of the word were considered as one term (e.g., mand and mands). Also such terms as discrete–trial instruction, discrete–trial training and discrete–trial teaching were treated as synonyms. 50 terms of 978 met the final criteria.

Figure 2 shows the results of the term analysis. The size of the circles represents the occurrence of a term (i.e., the larger the size, the higher the occurrence of a term in Author keywords). The distance between any pair of terms provides information on their relatedness as measured by co–occurrences. Colors are used to group terms into topics. Terms with the same color belong to the same cluster and are more closely related than terms with different colors.

The co–occurrence map shows that terms form a complex network in which six thematic clusters can be distinguished. The first cluster (red color) is associated with the functional analysis of behavior in the context of studying the different types of reinforcement (differential, negative, non–contingent reinforcement, etc.) and the maintenance and extinction of different forms of behavior. The second cluster (cyan color) is closely related to the first and focuses around the concept of stereotypy. It includes the vocal stereotypy, procedures for reducing stereotypy, the possibility of using stereotypic behavior as reinforcement, etc. Central themes of the third cluster (blue color) are preference assessment and compliance/noncompliance. The fourth cluster (green color) is associated with the study of social skills (play, social interaction, etc.). Its fundamental theoretical concept is generalization. The fifth cluster (purple color) focuses around the problem of verbal behavior and its various classes (mand, tact, etc.). Along with verbal behavior, its central concept is stimulus control. The sixth cluster (yellow color) concerns the problem of skill acquisition mainly by discrete–trial training (and also includes discrimination, error correction, etc.).

Authors and Their Cooperation

The 597 publications related to autism were written by 1,065 different authors. 1,048 are authors of articles published in JABA, and 31 are authors of articles published in JEAB. Thus, only 14 people (1.3%) have publications in both journals, and none of the authors have more than one article in JEAB. The majority of the authors (67.3%) are only credited in one publication, and only 7.6% have more than five articles. Table 2 shows the most productive authors publishing on the topic of autism within the behavior analysis framework.

As can be seen from the data presented in Table 2, the most productive authors are not necessarily the most cited. Thus, among authors with at least five publications, R. L. Koegel takes the first place in the number of citations, and E. G. Carr (N = 6, C = 687, C/N = 114.5, h = 38) ranked first in the ratio of the number of citations to the number of publications (this ratio can be considered as some indicator of effectiveness). From the top five of most productive authors, only W. W. Fisher has publications both in JABA and JEAB. The cooperation of the authors was analyzed with vosviewer software. In order to create a readable network, the threshold was set to a minimum of five publications for an author. Authors who are not related with other authors in the network were excluded. With these criteria applied, 72 authors were found to be linked in nine clusters (Figure 3).

The most cited article belongs to the most efficient authors by the C/N criterion (N = 1, C = 266, C/N = 266). This article is an evaluative review on the token economy (Kazdin & Bootzin, 1972). The most cited article published after the 2000s focuses on the usage
of the Picture Exchange Communication System (PECS) with children with autism (C = 245) (Charlop–Christy et al., 2002).

**Citation Analysis**

To assess the interaction between JABA and JEAB, we analyzed self- and cross-citations in these journals from 1968 to 2017, both for all publications, and for publications about ASD. The period from 1958 to 1967 was not included in the citation analysis, because JEAB was not published at that time.

In general, as can be seen from Table 3, the percentage of self-citations ranges from 27.2% to 40.5% for JABA, and from 25.1% to 45.1% for JEAB. It is noteworthy that these journals are characterized by differently directed time trends: the percentage of self-citations increases for JABA and decreases for JEAB. If to compare these data with the data shown in Table 1, it can be seen that the percentage of self-citations co-varies with the total number of articles: the more articles are published in the journal, the higher the level of self-citations (*p* = 0.72 for JABA; *p* = 0.85 for JEAB; *p* < 0.05).

The value of cross-citations in these journals differs significantly. On average, 4.5% of all citations in JABA were JEAB publications (second rank), up to 7.8% in some periods (1993–1997). The percentage of cross-citations for JEAB is much smaller: on average, the value of citations from JABA is only 0.9% (4th place), but there is an upward trend: in the last two five-year intervals the value of citations from JABA was 2% and 2.3% respectively.

Our data coincide with the results of other authors (Poling, Picker, Grossett, Hall–Johnson, & Holbrook, 1981; Poling, Alling, & Fuqua, 1994; Elliott, Morgan, Fuqua, & Poling, 2005). Analyzing self-citations and cross-citations in JABA and JEAB for 1993–2003, Elliott et al. (2005) indicated that the growth in the percentage of JEAB citations in JABA is connected with the efforts of the editorial actions by JABA editors toward integration of applied and fundamental areas of behavior analysis. At the same time, the level of JABA citations in JEAB remained stable and can be connected with the fact that the editorial policy of this journal was unchanged. It can be pointed out that the twofold increase in the share of JABA citations in JEAB observed over the past decade gives reason to hope that the editors of JEAB also began to make efforts towards the integration of fundamental and applied science and, consequently, we can expect further increase in JABA citations. Nevertheless, the general observation that Pauling et al. (1981) made more than three decades ago remains fair: there is the schism between experimental and applied behavior analysis and it is still not overcome.

The analysis of values of self- and cross-citations for JABA for articles related to the study of autism, shows that they practically do not differ from general trends: the average percentage of self-citations is 38.6%, the average percentage of cross-citations of JEAB articles is 4.4%. Figure 4 shows the map of co-citations constructed with the VOSviewer software for articles on autism published in JABA. The minimum number of citations of the source was set to 50. 25 sources met this threshold.

A completely different picture emerges in the analysis of JEAB articles on autism: the value for self-citations is 22.7% and the value for cross-citations of JABA articles is 13.4%. In other words, the percentage of self-citations is lower, and the percentage of cross-citations is much higher, than for the total number of publications. Interestingly, if in general JABA occupies the 14th rank in the list of journals that are cited in JEAB articles (after such journals as Journal of Experimental Psychology: Animal Behavior Processes, Psychological Review, Journal of Comparative and Physiological Psychology, Science, Animal Learning & Behavior, Journal of Experimental Psychology, etc.), then for the articles about autism, JABA rises to second rank. Thus, although the number of JEAB articles about autism is extremely small, it can be noted that much more attention is paid to the results of applied research there.

**Conclusion**

The results of our research showed that within the behavior analysis framework the study of autism is concentrated in the applied area, and there is a steady increase in the number of publications about ASD both in absolute and relative terms. Its percentage was almost 44% in 2013–2017. We have identified six main clusters of research in this area by the terms analysis. Both in behavior analysis in general and in the research field related to autism, there is the schism between experimental and applied works. Perhaps, as noted by Pauling et al. (1981), this is due to the fact that no one has yet clarified how experimental studies can be used in applied behavior analysis. And you can probably agree that this is no cause for concern; nevertheless the idea, that the fundamental study of the nature of ASD from the position of the experimental analysis of behavior is capable to advance applied works in this area, is quite intriguing.
Figure 1. Number of publications on autism, and cumulative number of publications about autism, in JABA and JEAB by year (1958–2017)

Table 1: Distribution of Publications about Autism in JABA and JEAB (1958–2017)

<table>
<thead>
<tr>
<th>Year Range</th>
<th>Number of articles on autism</th>
<th>Total number of articles</th>
<th>% articles on autism</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>JABA</td>
<td>JEAB</td>
<td>JABA</td>
</tr>
<tr>
<td>1958–1962</td>
<td>Not published</td>
<td>1</td>
<td>Not published</td>
</tr>
<tr>
<td>1963–1967</td>
<td>Not published</td>
<td>0</td>
<td>Not published</td>
</tr>
<tr>
<td>1968–1972</td>
<td>4</td>
<td>0</td>
<td>219</td>
</tr>
<tr>
<td>1973–1977</td>
<td>17</td>
<td>0</td>
<td>369</td>
</tr>
<tr>
<td>1978–1982</td>
<td>17</td>
<td>0</td>
<td>285</td>
</tr>
<tr>
<td>1983–1987</td>
<td>29</td>
<td>0</td>
<td>215</td>
</tr>
<tr>
<td>1988–1992</td>
<td>31</td>
<td>2</td>
<td>255</td>
</tr>
<tr>
<td>1993–1997</td>
<td>45</td>
<td>0</td>
<td>317</td>
</tr>
<tr>
<td>1998–2002</td>
<td>49</td>
<td>0</td>
<td>304</td>
</tr>
<tr>
<td>2003–2007</td>
<td>72</td>
<td>2</td>
<td>308</td>
</tr>
<tr>
<td>2008–2012</td>
<td>149</td>
<td>2</td>
<td>432</td>
</tr>
<tr>
<td>2013–2017</td>
<td>173</td>
<td>4</td>
<td>396</td>
</tr>
<tr>
<td>Total number</td>
<td>586</td>
<td>11</td>
<td>3100</td>
</tr>
</tbody>
</table>

Note: Only scientific articles and reviews were taken into account when counting the number of publications. The total number of publications, including notes, errata, editorial articles, etc., was 7423.
Figure 2. The term map of Author keywords of the publications about autism in JABA (1968–2017)

Table 2: Top 5 Productive Authors Publishing on ASD in JABA and JEAB (1968–2017)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Author</th>
<th>Country</th>
<th>Number of publications (N)</th>
<th>Citations (C)</th>
<th>C/N</th>
<th>h–index</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fisher W.W.</td>
<td>USA</td>
<td>36</td>
<td>841</td>
<td>23.36</td>
<td>39</td>
</tr>
<tr>
<td>2</td>
<td>Kodak T</td>
<td>USA</td>
<td>30</td>
<td>288</td>
<td>9.60</td>
<td>13</td>
</tr>
<tr>
<td>3</td>
<td>Lerman D.C.</td>
<td>USA</td>
<td>23</td>
<td>329</td>
<td>14.30</td>
<td>26</td>
</tr>
<tr>
<td>4</td>
<td>Ahearn W.H.</td>
<td>USA</td>
<td>18</td>
<td>442</td>
<td>24.56</td>
<td>17</td>
</tr>
<tr>
<td>5</td>
<td>Koegel R.L.</td>
<td>USA</td>
<td>17</td>
<td>1590</td>
<td>93.53</td>
<td>47</td>
</tr>
</tbody>
</table>
Figure 3. Network of co-authorship for ASD research in JABA and JEAB (1958–2017)
Figure 4. Co-citation analysis for cited sources in the publications about autism in JABA (1968–2017)
Table 3: Self- and Cross-Citations in JABA and JEAB (1968–2017)

<table>
<thead>
<tr>
<th>All articles</th>
<th>Articles about autism</th>
</tr>
</thead>
<tbody>
<tr>
<td>JABA</td>
<td>JEAB</td>
</tr>
<tr>
<td>JABA</td>
<td>JEAB rank</td>
</tr>
<tr>
<td>JABA %</td>
<td>JEAB %</td>
</tr>
<tr>
<td>1968–1972</td>
<td>27.2</td>
</tr>
<tr>
<td>1973–1977</td>
<td>30.2</td>
</tr>
<tr>
<td>1978–1982</td>
<td>22.9</td>
</tr>
<tr>
<td>1983–1987</td>
<td>24.1</td>
</tr>
<tr>
<td>1988–1992</td>
<td>24.1</td>
</tr>
<tr>
<td>1993–1997</td>
<td>28.6</td>
</tr>
<tr>
<td>1998–2002</td>
<td>39.8</td>
</tr>
<tr>
<td>2003–2007</td>
<td>40.1</td>
</tr>
<tr>
<td>2008–2012</td>
<td>40.5</td>
</tr>
<tr>
<td>2013–2017</td>
<td>38.0</td>
</tr>
<tr>
<td>In total</td>
<td>32.3</td>
</tr>
</tbody>
</table>

Note: Considering the small number of publications about autism in JEAB, self-citations and cross-citations for five-year intervals were not analyzed.

References


Visit BOOKS at www.behaviorology.org

At www.behaviorology.org тібі provides a range of information on as many behaviorology resources as possible, including books and audio/visual materials, as well as electronic versions of back issues of *Journal of Behaviorology* and its predecessor *Behaviorology Today*. Some recently described books are (a) *Explaining Mysteries of Living* by Stephen Ledoux, (b) *A World of Our Own Making* by Michael Shuler, (c) *About Science, Life, and Reality* by Lawrence Fraley, (d) *Functional Behavioral Assessment* by James O’Heare, and (e) *Science Works on Human Behavior* by Stephen Ledoux. Check out the descriptions of these and all of the many other behaviorology books on the тібі website.
### Table of Contents for the book, *About Science, Life, and Reality*, by Lawrence Fraley*

**PART I: The Role of Philosophy in a Scientific Perspective on Behavioral Phenomena** … 3

Science and Culture … 5

Natural Science and Its Behaviorological Component … 7

The History of Behaviorology … 16

The Cultural Success of Organized Science and Responses from its Competition … 19

The Organization of both Natural Science and its Alternatives for their Respective Cultural Roles … 23

The Academic Management of the Conflicting Priorities … 36

The Great Mystery of Life … 43

The Tenacious Reliance on Personal Mini–Deities … 45

Summary: Cultural Problems and Their Solution via Science … 48

Transition to Parts II –IV … 54

**PART II: Reality and the Interdisciplinary Approach Required to Comprehend it, with Implications for Sentience and Sociality** … 57

The Traditional Perspective … 59

Changing the Perspective … 71

A Review Featuring an Example … 80

Summary and Conclusion … 85

**PART III: A Further Recourse to Behaviorological Principles for Analyzing Some Implications of Traditional Reality** … 89

Cultural Seduction … 91

**Traditional Sociality and Its Counterpart from the Internal Perspective** … 92

Neural Behavior, Energy Streams, and Reality … 95

Conclusion … 119

**PART IV: Contrasting the Implications of the New Internal Perspective with those of the Traditional Perspective** … 123

Cooperative Natural Sciences … 127

Behaviorology and Neural Physiology:
- Adjacent Scientific Neighbors … 127
- A Summary and Review of Reality … 129
- Starting Inquiries with Better Fundamental Assumptions … 138

Emergent Commonality Amid Individual Isolation … 145

- The Mystery of Social Behavior … 145
- Environmental Reality … 152
- Resolution of the Traditional and Internal Perspectives … 159

**PART V: Conclusions** … 163

Science … 165

Life … 169

Reality … 175

Endnotes … 189

About the Author … 216

*(2019) New York: Page Publishing. (toc assembled by Stephen Ledoux, upon receiving a copy that lacked a toc.) Address correspondence either to ledoux@canton.edu or to the author of the book, Lawrence Fraley, at lfraley@citlink.net. (See www.behaviorology.org for a full description.)
Editorial Review Board & Guest Reviewers for This Issue

Editorial Review Board members:

› Dr. Traci Cihon
› Mr. Chris Cryer
› Dr. John Ferreira
› Dr. Lawrence Fraley
› Mr. Bruce Hamm (Editor)
› Dr. Stephen Ledoux
› Mr. Werner Matthijs
› Dr. James O’Heare
› Ms. Katie Rinald

Guest Reviews:

› Mr. Mark Bopp

Visit www.behaviorology.org

Stay informed by visiting the TIBI web site regularly (www.behaviorology.org). We are always adding and updating material.

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

Back Issues & Donations

Some back issues of the Journal are available; the cost is US$20 each, which includes air–equivalent postage. To place an order: Photocopy, fill out, and send in the “membership” form on a later page of nearly every Journal issue; check the “back issues” box, and list the volume and number of each back issue that you are ordering. Mail the form, with a check for the correct amount, in US dollars made payable to TIBI, to the address on the form.

Donations/Contributions are also welcome, and are tax–deductible as TIBI is non–profit (under 501–c–3).

Journal & Website

Copyrights

While authors retain copyrights to their articles, The International Behaviorology Institute (TIBI) holds the copyright to www.behaviorology.org and to Journal of Behaviorology, the TIBI journal:

Copyright © 2020 TIBI, Inc.
Submission Guidelines

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

To submit items, contact the Editor:
Dr. James O’Heare (Action Editor)
Companion Animal Sciences Institute
1333 Rainbow Crescent
Ottawa Ontario K1J 8E3
CANADA
E-mail: jamesoheare@gmail.com

Considerations

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

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

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

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

Mechanics

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

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

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

Note: Authors’ views need not coincide with official positions of TIBI, and authors retain copyrights.

Ottawa Ontario K1J 8E3

E-mail: jamesoheare@gmail.com
TIBIA Membership Costs & Criteria & Benefits

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

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

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

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

**$60 Associate membership (requires completed paper application and annual dues payment).** This level is only available to qualifying individuals. Admission to TIBIA in the Associate membership category is open to all who are not students, who document a behavioral repertoire at or above the masters level (such as by attaining a masters–level TIBI Certificate or a masters degree in behaviorology or in an accepted area) and who maintain a good record—often typical of “early–career” professionals—of professional activities or accomplishments of a behavioral repertoire at the doctoral level, an Associate member may apply for, or be invited to, Advocate membership.

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

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

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

*(Retired Associate, Advocate, or Board Members: 50% less)*

---

**TIBIA Membership Application Form**

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

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

Mr. Chris Cryer  
TIBIA Treasurer  
406 North Meadow Drive  
Ogdensburg NY 13669  
USA

**Check if applies:**

- Contribution: □
- Subscriptions: * □
- Back issues: ** □
  - Vol. ____, #___
  - Vol. ____, #___

Name: ____________________________________________

Membership (category): □

Amount enclosed: US$

Office Address: __________________________________

Home Address: __________________________________

Office Phone #: ________________________________

Home Phone #: __________________________________

CHECK PREFERRED MAILING ADDRESS:

Office: □  Home: □

E-mail: ________________________________________

Degree/Institution: ***

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

***For Student Membership:

I verify that the above person is enrolled as a student at:

Name & Signature of advisor or Dept. Chair: ____________________________
**TIBI/TIBIA Purposes**

TIBI, as a non-profit educational corporation, is dedicated to many concerns. TIBI is dedicated to teaching behaviorology, especially to those who do not have university behaviorology departments or programs available to them. TIBI is also dedicated to expanding and disseminating the behaviorological literature at least through the fully peer-reviewed *Journal of Behaviorology* (originally called TIBI News Time and then Behaviorology Today) with editors being appointed by the TIBI Board of Directors, usually from among the TIBIA Advocate members. 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 the purposes of TIBI/TIBIA. These activities include (a) encouraging and assisting members to host visiting scholars who are studying behaviorology as well as holding conventions and conferences; (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 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 and TIBIA 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.

*Adapted from the 2017–updated TIBI By–Laws*
About Behaviorology, TIBI, and Journal of Behaviorology

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

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

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

Traci Cihon, Ph.D., DBLC, BCBA—D  
Depart. of Behavior Analysis, UNT  
Denton TX  
traci.cihon@unt.edu

Chris Cryer, M.A., MLBC, BCBA, LBA (TIBI Treasurer)  
St. Lawrence NYSARC  
Canton NY  
ccryer@slnysarc.org

John B. Ferreira, Ph.D., DLBC, LPC  
Ess–Plus Behaviorological Counseling (Retired)  
Mattapoisett MA  
jbf721@aol.com

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

Bruce Hamm, M.A., MLBC, BCBA (JoB Editor)  
Director, Blackbird Academy of Childhood Education  
Vancouver BC  
brucehamm@me.com

Stephen F. Ledoux, Ph.D., DLBC (JoB Co-Managing Ed.)  
Professor Emeritus, SUNY–Canton  
ledoux@canton.edu

Werner Matthijs, M.A., MLBC  
Team Coördinator van de Toegepaste Gedragsologie  
Universitair Psychiatrisch Centrum Sint Camillus,  
Bierbeek Belgium (Retired)  
werner-matthijs@hotmail.com

James O’Heare, DLBC (TIBI Board Chair)  
Companion Animal Sciences Institute  
jamesoheare@gmail.com

Katie Rinald, M.A., BCBA, MLBC  
Blackbird Academy of Childhood Education  
Vancouver BC  
katierinald@gmail.com

Journal of Behaviorology

Bruce Hamm, BCBA, Editor  
2922 East Kent Avenue South #14  
Vancouver BC V5S 0G8  
CANADA