

# Work Takes a Holiday— Confessions of a Natural Scientist of Behavior (Updated)

*For a better future*





Photo by Stephen F. Ledoux

# Burrhus Frederic Skinner

(1904–1990)

Conversing at a convention in 1982

*The products of the contingencies of his life established behaviorology.*

# **Work Takes a Holiday— Confessions of a Natural Scientist of Behavior (Updated)**

*A natural scientist of behavior  
provides an autobiographical account  
of what caused his—and can cause  
others’—participation in science and  
its beneficial applications.✿*

**Stephen F. Ledoux**

**with Forewords by**

**Richard Malott** *Professor Emeritus, Western Michigan University*

**and Michael Clayton** *Professor, Missouri State University*

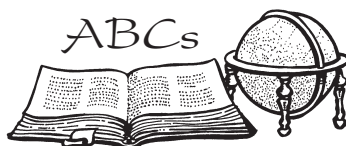
Published by *ABCs*, Los Alamos, NM, USA.

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# *Work Takes a Holiday—Confessions of a Natural Scientist of Behavior (Updated)*

**Stephen F. Ledoux**

Published by ABCs of Los Alamos, NM, USA  
(Previously of Canton, NY.)



ISBN 978–1–882508–68–6 (softcover edition)

Cover design and book layout by Stephen Ledoux    Printed in the United States of America

**Prospective cataloging-in-publication data (under “natural science,” or “life science,” but *not*—since behaviorology [i.e., the natural science of behavior] is not any kind of psychology—under psychology or “BF” as such cataloging would be like placing a biology book under creationism):**

Ledoux, Stephen F., 1950–.

*Work Takes a Holiday—Confessions of a Natural Scientist of Behavior (Updated)*

Stephen F. Ledoux

xx, 504 p. ill. 26 cm.

Includes bibliographic references, list of documents and photographs, index.

1. Autobiography. 2. Natural science. 3. Natural science of behavior.

4. Behaviorology. 5. Human behavior. 6. Contingency engineering.

I. Title.

ISBN 978–1–882508–68–6 (acid-free paper)

This edition is printed on acid-free paper to comply with the permanent paper z39.48 standard of the American National Standards Institute.

*Improved printing number:*    >10   9   8   7   6   5   4   3   2   1   0

*Nearest year of release:*    >2050   2045   2040   2035   2030   2025   2024

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This book provides information regarding the subject matter covered with the understanding that the author and publisher are not providing *any* professional services; if problem behaviors occur, and expert assistance is desired or required, contact a competent applied behaviorologist or BCBA (Board Certified Behavior Analyst). The publisher and author hereby exclude all liability to the extent permitted by law for any errors or omissions in this book and for any loss, damage, or expense (whether direct or indirect) suffered by a third party relying on any information contained in this book.↻



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## ***Dedication***

*May the new—& presently unusual—aspects  
of this work  
support the efforts of all writers  
of biographies  
& thus increase the pleasures of—&  
value for—their readers.∞*

## ***Note About This “Updated” Edition***

*A* task—during a break from writing after completing the original edition of my autobiography—involved carefully sorting through *all* my old files and papers to find any relevant documents, papers, pictures, and so on that my previous reliance on memory had not turned up. Working the resulting discoveries into my autobiography led to this *Updated* edition. Along the way this edition also accumulated additional items to assist curious readers, such as the *List of Documents and Pictures* and the *Index*.

## ***Acknowledgements***

*So* many people whose lives intersect this story—rather too numerous to mention individually here—already deserve and hereby receive my thanks. Others, however, whose activities relate directly to the production of this story and book, deserve specific mention. Thus my spouse, Nelly Case, gets my thanks for letting my variable writing schedule interfere with our otherwise regular routines. My friend, colleague, and novelist Michael Shuler, gets my thanks for his helpful comments and feedback. And my friend, colleague, and informal but regular and important mentor, Richard Malott, gets my thanks both for helping get me started in the natural science of behavior, with his and Don Whaley’s book, *Elementary Principles of Behavior* (cited several times in various chapters) and for helping me finish this book with his wonderful ranting Foreword. Similarly my thanks also go to my friend and colleague, Michael Clayton, for the fun and informative Foreword that he wrote for this *Updated* edition.∞



## *On Typography & Related Resources*

This book is set in the Adobe Garamond, Adobe Garamond Expert, and Tekton collections of typefaces. In addition, a valuable basis for the typographic standards of this work deserves acknowledgment. As much as possible, this book follows the practices described in two highly recommended volumes by Ms. Robin Williams. One is the 1990 edition of *The Mac is Not a Typewriter*. The other is the 1996 edition of *Beyond the Mac is Not a Typewriter*. Peachpit Press, in Berkeley, CA, USA, publishes both of these books.

For example, on page 16 of the 1990 book, Williams specifies practices regarding the placement of punctuation used with quotation marks, an area in which some ambiguity has existed with respect to what is “proper.” In addition the present book follows the advice in these books about avoiding “widows” and “orphans.” People concerned with good typography use the term “widow” when fewer than two words remain on the last line of a paragraph. They use the term “orphan” when the first line of a paragraph remains alone at the bottom of a page, or when the last line of a paragraph remains alone at the top of the next page. Good typography helps improve the reading experience. Ignoring good typography can occasionally even leave readers stuck with a widowed orphan.

Perhaps ignoring good typography stems from a misguided notion that poor typography saves lines (or time) and thus dollars which, over a book-length document, it virtually never does... In this and a few other publishers’ books, a widow or orphan is considered a typo.

Also, since some confusing alternatives remain regarding the use of hyphens and dashes, this book would simply limit hyphens to separating the parts of words that break at a line end, although this book never breaks words at line ends, because good software (e.g., Adobe InDesign5) makes that old, hard-to-read practice unnecessary. (Too many publishers think that this—hyphenless lines, especially with “justified” text, like on this page—is impossible without producing “rivers of white,” but the book you hold in your hands, and many others by different publishers, prove otherwise.)

Beyond hyphens (i.e., “-”), “en dashes” (i.e., “—”) most commonly separate the whole words of compound adjectives, and “em dashes” (i.e., “—”) most commonly set off multiple-word—a compound adjective with an en dash—phrases or clauses (as with these examples). These easy-reading characteristics developed across humanity’s centuries of successful printing-press practices. Be aware, however, that ebook formatting, while it has its own benefits, typically destroys most of these easy-reading characteristics.

You can address correspondence regarding this book to the author or publisher, ABCs, at 26 Timber Ridge Road, Los Alamos NM 87544. You can find many articles mentioned herein from *Behaviorology Today* (ISSN 1536-6669), later renamed *Journal of Behaviorology* (ISSN 2331-0774), at [www.behaviorology.org](http://www.behaviorology.org) (the free-access website of TIBI, The International Behaviorology Institute). You can also find full descriptions of many of the books mentioned herein, including sources for them, on the BOOKS page of this website, which does not sell books.☺

## ***Foreword & Richard's Rant***

**Richard Malott**

*Professor Emeritus, Western Michigan University*

Although I disagree with much of this book, I highly recommend you read it. Why? Because it's the autobiographical history of a person becoming and being a scholar, scientist, and professor of science, continuing into a scholarly "retirement life," oh yes, and also a photographer, prize-winning cook, and magician, with a bunch of other interesting life details thrown in, along with a little bit of humor, and more visuals, even more great visuals than any autobiography I've ever read. Oh yes, and it's very well written and very readable.

By the way, be careful of *Chapter 6*, because Stephen hypes Los Alamos so effectively, that I'm about ready to close shop in Kalamazoo and move down there. [Editor's note: Be aware that, for a small town/county of about 20,000 residents, with a National Laboratory, the local newspaper lists 33 places of worship in its directory. Is that a turn on, or a turn off?]

One of Stephen's enticements for my writing this foreword was that, not only would I have the opportunity to read the pre-publication draft of this excellent book, but I'd also have a chance to do a little ranting—one of my favorite pastimes. So, danger: ranting ahead.

My slogan is, "Save the world with behavior analysis." It's just a joke, but one that I take seriously. I know behavior analysis won't save the world. But, I've devoted most of my life to using behavior analysis to save one little chunk of it, one child with autism at a time, and their families, one college student at a time, one little organizational systems problem at a time.

And I think Stephen's slogan should be, "Save the world with Behaviorology." And he's devoting most of his life to promoting behaviorology as the savior of the world. The difference between him and me is that it ain't no joke, at all, for Stephen; he seems to believe that behaviorology can really do this important trick.

[Editor's note (Editor's Rant? Added in part to enhance the length of this foreword for the reader's pleasure): What?! "Save the world with behavior analysis" was a joke? Even a taken seriously joke? After all the people, including Stephen, who took you ever so seriously over the decades? I suppose there's no Santa Claus either (even though you got this Foreword to me on Christmas Day, 2021; by the way, thank you). But seriously, Stephen says "*The Times They Are A-Changin'*"; the circumstances that enabled "save the world ..." to be a joke—even a taken seriously joke—changed on all of us. He seriously enjoyed the joke with you, seriously, back in the twentieth century but, by the time the twenty-first century began, circumstances started to force us all to take the "joke" ever more seriously. So, following you by providing some imitative ranting, Stephen says he believes that all of us in the natural science of

behavior, whether called behavior analysis or behaviorology, must continuously contribute our shares to the science–team efforts of helping all the natural sciences “save the world.” Keep on ranting on! “We are running out of time.”]

Stephen also describes, in detail, a phenomenon that most people not in academic departments might not know of—how blood thirsty the intradepartmental battles can be, when one side finds that its approach to saving the world is in conflict with the other’s approach.

Another similarity between Stephen and me is that we’re both terminology fanatics. We’ve both dedicated a part of our scholarly careers to improving the precision and accuracy of our field’s terminology and concepts. But, I can’t begin to keep up with him, in either the amount of effort or the radical recommendations that he’s made.

As a result, Stephen states that social scientists criticize him for not speaking/writing English. [Editor’s note: The natural scientists who were at the same meeting, where the criticism was leveled, then inducted Stephen as a member into a major natural–science organization. Did they like his “not speaking/writing English?”] On the other hand, my behavior–analysis colleagues criticized me for trying to make behavior analysis *more* English: In my textbook, (now Malott & Kohler, 2021) I wanted to use the common English word, “reward,” instead of “reinforcer”; but my behavioral buddies raised such a storm that I chickened out. Also, I don’t necessarily agree with him on his major recommendations, but I find following his efforts to be a fascinating trip.

Like many behavior analysts who complain that the field of behavior analysis has become dominated by applications to the problem of autism, Stephen, the behaviorologist, also makes that criticism of our concentration on autism. But it ain’t our fault; it’s the fault of the autism mamas, the ones who’ve worked so hard for decades to get good behavioral support for their autistic kids and those of others. It’s just like the mamas against drunk driving who’ve worked so hard to make sure no more drunk drivers kill kids. And state by state, both sets of mamas have had a major, positive impact. So, what Stephen and the other critics of our emphasis on autism treatment need to do is encourage the organization of mothers against climate change, air pollution, radioactivity, over population, illiteracy, poverty, racial inequality, etc., etc. [Editor’s further—and hopefully polite—ranting note: Stephen says he fully supports Dick’s very astute and timely suggestion, and is happy to help those younger people who implement it (as they have the life span in which to do so). What are you younger readers waiting for?! He also fully supports the success of this science in helping deal effectively with autism, but he fully supports all the other applied areas as well, areas where he says society also desperately needs the scientific knowledge and skills of BCBAS.]

And finally, Stephen's *new grammar* forbids the use of personal pronouns, because they support *the false notion of the existence of inner agents inside people causing their behavior*. [Now, Dick: Yes, while they do that, "forbid" is awfully strong, like he's made it the eleventh commandment, but he doesn't make it that, although he does include the ten commandments of natural science in the book.—Editor.] And though he only seems to shy away from the personal pronoun *I*, he does so with amazing grace which is especially impressive given that this is his autobiography.

Stephen, thanks for a very delightful read,

*Dick*

2021 December 20

[Editor's note: Stephen said to say "Thank you for this delightful Foreword, and Los Alamos is waiting to welcome you. You are not, however, done ranting yet, are you? 'Hope not.'" ] ❄

## References (with some annotations)

- Malott, R. W. & Kohler, K. T. (2021). *Principles of Behavior (8th Ed)*. New York: Routledge. The latest evolutionary edition of Whaley & Malott, 1971, this is one of the books that Stephen says started him out on his natural-science journey. For several years he first used Whaley & Malott, 1971, and then an earlier edition of *Principles of Behavior*, for his introduction to psychology courses.
- Whaley, D. L. & Malott, R. W. (1971). *Elementary Principles of Behavior*. Englewood Cliffs, NJ: Prentice-Hall. A classic primer on behaviorological science and applications, this book was also fun for students to read. Some of them have even "complained" to Stephen about not being able to stop reading it!

**NOTE:** *Many of the books listed in the References at the end of each chapter in this book are available "Print-On-Demand" from [www.lulu.com](http://www.lulu.com) (click the magnifying glass and enter an author's name). They also have full descriptions on the books page of [www.behaviorology.org](http://www.behaviorology.org) and some may be available in digital formats, initially through Direct Book Service at 800-776-2665. (They will likely answer the phone with "Dogwise," because their most popular speciality involves books about our canine friends; several of these books already specifically apply the laws of behavior that other books systematically cover.) [This NOTE does not appear in every chapter.]* ❄

***Foreword: One More Step to  
“Save the World”—  
Contingencies Over Agents***

**Michael Clayton**

*Professor, Missouri State University, Springfield*

Stephen Ledoux is a “carbon unit” (actually, in his words, a “DNA-based carbon-unit locus of contingency effects”) with a story to tell, the personal story of his life, which he also tells as a science story. So he works diligently to discard the agential aspects of our language including personal pronouns, especially the pronoun “I” that is so common in the language of our culture, because these pronouns coincidentally support the historic falsehood of inner causal agents being responsible for our behavior by seeming to refer to such agents. Being scientifically consistent, he thus does not take credit (or blame)—though he does take responsibility, as in experiencing the consequences—for his actions, accomplishments, mistakes, and setbacks. Contingencies serve *that* function for everyone, including someone who has so thoroughly adopted a natural science of behavior. This makes writing an autobiography a unique challenge. If a person is the locus at which genetic and historical factors like contingencies come to bear over a lifetime, it is difficult, if not impossible, for the person to take a lot (or any) of the credit for the life they have lived.

But Stephen has done just that. He has written an in-depth analysis of the past and present contingencies (i.e., the relations between measurable, mostly environmental independent variables and measurable behavior dependent variables) that have contributed to his development and current functioning as a carbon-based unit. This fascinating narrative of a fully examined lifetime of experiences is but one part of a larger whole. His main goal is to provide a real example of describing, according to a purely natural science of behavior, a life lived in service to a larger goal, the goal of encouraging others to pick up the knowledge and tools of behaviorology (the label that he and others use for the natural science of behavior) and use them to help tackle the myriad problems facing the culture and world today. Ultimately, he envisions the comprehensive institutionalization of the natural science of behavior in higher education (see Ledoux, 2021a) a lofty, but worthwhile goal.

What was initially a 40-page chapter in a book of collected autobiographies (Ledoux, 2022) rather quickly evolved into *this* 500-page book, *Work Takes a Holiday—Confessions of a Natural Scientist of Behavior (Updated)* (containing 200 pages of autobiography in ten chapters plus extensive textual and graphic materials, appendices, and documents). I really enjoyed being given a front row seat to observe a well-lived life with many meaningful goals. Stephen is an adamant supporter of natural science and desperately wants to share his



obvious love of science with everyone he meets. As a fan of *Star Trek*, he was later pleased to recall that the actor LeVar Burton was a student in one of his very first courses, which he taught at his old high school. Also he spent many pre-retirement years collecting meteorites before arranging for the bulk to go to a university museum and retiring to Los Alamos, New Mexico, which surely must be one of the most science-based cities in the country.

From assessing the relevant indicators, Stephen believes strongly that the natural sciences have given us the tools to “save the world” and he backs up that belief. Reading just the 200+ pages of autobiography seemed likely to be a daunting task but, as soon as I began, I found every page to be very compelling. The breadth and depth of information included in this story holds your attention as you move from flying airplanes, living in China, interacting with B. F. Skinner, dealing with academic intrigue, to helping save the world with the natural science of behavior, and even winning a national cooking contest. I encourage everyone to spend the time to read this book. It inspired me and I am certain it will inspire you too.

This book also prompted me to reminisce more over my own history recently. There is a degree of correspondence between Stephen’s history and my own. We have had many similar experiences over our lifetimes, albeit at different points in time. We both attended a state university in California, in Stephen’s case in Sacramento (after six years in high school and college seminaries), and in my case, in Hayward (with no seminary experience). We have both had many jobs over the years. Unfortunately (!) I was never a grave digger, even for \$3.50/hour in union wages (in 1970 dollars) like Stephen. He taught his first formal, semester-long, behavior-science courses during his last undergraduate semester and, after receiving his master’s degree, he got a job as a file clerk with the California State Department of Motor Vehicles. I worked for the United States Bankruptcy court in Reno during graduate school. It would seem we both have an appreciation for lumbering bureaucracies. After receiving his degree, he decamped to Australia, with little more than two trunks, to continue his teaching career. After graduation, I left to teach in Guam with little more than two trunks. We both grew up under the flight paths of commercial airlines; he in Sacramento and me in San Francisco. I only wish I would have had the foresight to learn to fly planes like Stephen as well.

I was awestruck by the sheer amount of behavior over many years. The volume of people, places, and things that he has experienced is enviable. He documents, with the actual letters that they exchanged, a lengthy correspondence with B. F. Skinner over years. Stephen even had first-hand experience with an Aircrib, Skinner’s late 1940s invention. That is the kind of historical curiosity that I have tried to describe to students over time, but without first-hand experience, I fear I have mostly come up short.

The reader comes away with an appreciation for sheer doggedness in the pursuit of meaningful goals over a lifetime. Stephen has clear objectives and has pursued them continuously. But he also has many interesting hobbies, something I need to spend more time developing. He has devoted much of his life to photographic art and includes many fine examples across the chapters and appendices. He has a long-standing appreciation for space and

stargazes routinely. The meteorite collection is obviously directly related to his interest in space and science generally. He is also a collector and appreciator of Chinese, Japanese, and Native American art. Examples of this art are scattered throughout the book, and I was particularly impressed by the Chinese scroll paintings that he collected while teaching in China. We both lived in China for a time, he for longer than I, but the art speaks to both of us and likely to others as well.

There is a beauty to the writing that is felt over time. In spite of writing an extensive autobiography without using the personal pronoun “I” (except in quotations, usually from others) there is a degree of intimacy shared, and honestly done so, that results in very engaging reading. Among several China-related experiences, Stephen tells a family story of his father announcing that Stephen was Chinese. His father’s reasoning was that since he had read that every fourth person on the planet was Chinese, and Stephen was the fourth child in the family, Stephen “was Chinese.” This, and other amusing and informative anecdotes, are to be found throughout the book. The value in stories like this one is that they support the notion of contingencies over agents. Stephen could have just as easily said “he always liked” China and “just decided” to visit. Instead, we are given relevant parts of environmental history that made visiting China more likely later in life; his “being Chinese” is only one of them. Because he includes so much detail and supporting material, you find yourself referring to specific segments again and again.

In addition to personal reminiscences, Stephen gently introduces the reader to more complex topics in the history of behaviorism and behavior science. There are, of course, many students and professionals who identify as “behavior analysts,” but most are largely unaware that there is a strain within the natural science of behavior that developed in the 1980s and that acknowledges a need to go one step further and exist independently from the field of psychology. Instead of referring to behavior analysis, Stephen refers to a natural science of behavior which encompasses those thoroughly trained in “behavior analysis” and in “behaviorology.” In a nutshell the difference between behavior analysts and behaviorologists is that the former may still harbor hopes of remaking psychology in their image (an image that, for better or worse, does not impress psychologists) while the latter leave psychology behind and strike out on their own with other like-minded sciences. Stephen is a determined behaviorologist and he stands in good company with many including Skinner who wrote often of the need to abandon psychology and join with physiologists, anthropologists, and ethologists.

That approach is worthwhile, and I have long admired the behaviorologists for their intellectual rigor and dedication. I fondly recall a TIBA (The International Behaviorology Association) conference in Logan, Utah, where I was able to interact with Carl Cheney, Stephen Ledoux, Glenn Latham, and Ernie Vargas as a graduate student. To encourage participation by the “next generation,” Glenn Latham even invited me to stay at his home. As a relatively impoverished graduate student, I gladly accepted the offer. This experience led to my use of Latham’s parenting books in the classroom for years to come, something Stephen did also (e.g., see Latham, 1994, 1999, and Ledoux, 2001).

That divergence of behaviorology from behavior analysis, based on incompatible goals (i.e., leaving psychology behind versus remaking psychology) has hurt both fields, notably the latter. Behavior analysts have thus far thrived in comparison to behaviorologists, largely due to society's need for quickly trained and board certified professionals to successfully serve the needs of persons with developmental disabilities and autism. But such thriving has occurred at significant cost to their intellectual reputations, because there is so much more—that their training seldom covers—to the natural science that informs their interventions. Meanwhile, behaviorologists' training comprehensively emphasizes all aspects of the science along with the widest range of application areas, many of which are areas that society currently needs drastic help with, because they bear on solving global problems. Furthermore, due to the demands of board certification and the exigencies of autism treatment for young children, behavior analysis and the field of education have begun to merge to an unhealthy degree. If you believe that psychology has suffered due to its dependence on untestable agential causation, education is even more dedicated to this paradigm, and the suffering will only increase. Behavior analysis, by lashing itself tightly to education, will likely come to regret that association.

The overall goal of Stephen's book is to inspire others to apply the tools of a natural science of behavior to help solve the many problems caused by human behavior that threaten the species long-term survival. The author's goal and perspective are extremely timely. The current state of the world has increased interest in newer ways of living, and actions we can take, to make the world a better place. The idealism of the 1970s seems to be resurfacing again in the 2020s. Today's youth really do seem very motivated and inspired to do something, anything, to make the world a better place.

This book is also important to the public discourse, because it provides a template for staying engaged in the world and working towards solutions to the world's problems. The author's example over many decades is inspiring. Stephen has always kept at it, despite various headwinds in the world, his career, and his personal life. He shows the value of believing in something so dearly and not deviating from your goals.

Reading this autobiography makes you want to clarify what is most important to you. In the parlance of ACT, I spent time exploring my values after reading this book. I wanted to make sure that I was not being distracted by the many shiny objects our culture is replete with. In this vein, Stephen convincingly argues for the avoidance of smartphones, and I couldn't agree more. Modern smartphones allow a person to "distract themselves to death." Just think how much more time you would have without a smartphone. There are obviously important and interesting uses for smartphones, but their value is overestimated. I am embarrassed to admit how much social media and other internet pursuits distracted me during the writing of this foreword. [Editor's note: Stephen reports that he has avoided smartphones (a) under his eye doctor's medical instructions, and (b) because he has lacked substantive needs for such a wonderfully useful but expensive piece of technology; with his

increased traveling in and beyond 2024, however, he may be getting one for travel communications, but *not* while driving.]

I have known Stephen for decades now. He has always been generous with his time and intellect. He has contributed to my development and career in many ways and now, through this and his other books, he may contribute to yours. Like him, I have come to *like writing* as opposed to *liking having written*. His productivity in this regard is astounding. Scores of books and chapters have been written. Before and during the 2020 pandemic, he wrote 144 newspaper columns on the natural science of behavior, columns that the *Los Alamos Daily Post* was printing until the pandemic required the paper's pages for health-related articles, columns that could help the public with the ordinary and increased challenges during the pandemic, particularly concerning parenting and education, columns that could help get the public on board with a natural science of behavior (see Ledoux, 2021b, 2021c). Of interest to the more academically inclined, Stephen's use of *coincidental* reinforcement in place of *accidental* reinforcement is inspired. Skinner's and Dick Malott's use of "accidental" over the years has always felt NQR (not quite right) to me. I think *coincidental* is more accurate terminology and will begin using it in all my classes this Fall semester.

One final thing about the both of us. We both enjoy a nice, easy-reading font. I had a long talk with Stephen about good typography and fonts a couple of years ago and, from that day forward, resolved to use his recommendation of Adobe Garamond in all my writing.

Mike Clayton  
2023 August 1 ✨

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- Ledoux, S. F. (2021c). *Science Is Lovable—Volume 2 of Explaining Mysteries of Living (Expanded)*. Los Alamos, NM: ABCs (72 more newspaper columns, many with color graphics, covering deeper topics in behaviorology such as some initial scientific answers to some ancient human questions on topics like values, rights, ethics, morals, language, consciousness, personhood, life, death, reality, and even some more recent topics, along with three column-supporting papers; all the newspaper columns are freely accessible on [www.BehaviorInfo.com](http://www.BehaviorInfo.com) and this book is available print-on-demand from [www.lulu.com](http://www.lulu.com) with a full description on [www.behaviorology.org](http://www.behaviorology.org)).
- Ledoux, S. F. (Contributing Editor). (2022). *Less-Traveled Roads—Circumstances That Produced Natural Scientists of Behavior*. Los Alamos, NM: ABCs. This 200-page, full-color, softcover book contains the autobiographies of several authors focusing more on the contingencies—and so less on the traditional “agencies”—responsible for the activities, developments, and products of lives. [Editors Note: This book includes a chapter by Michael Clayton and a 40-page-long chapter version of this autobiography; available print-on-demand from [www.lulu.com](http://www.lulu.com) with a full description on [www.behaviorology.org](http://www.behaviorology.org).]

**NOTE:** *Many of the books listed in the References at the end of each chapter in this book are available “Print-On-Demand” from [www.lulu.com](http://www.lulu.com) (click the magnifying glass and enter an author’s name). They also have full descriptions on the books page of [www.behaviorology.org](http://www.behaviorology.org) and some may be available in digital formats, initially through Direct Book Service at 800-776-2665. (They will likely answer the phone with “Dogwise,” because their most popular speciality involves books about our canine friends; several of these books already specifically apply the laws of behavior that other books systematically cover.) [This NOTE does not appear in every chapter of the autobiography.]*



Occasional blank pages provide extra space for:

## *Reader's Notes*

# *Work Takes a Holiday— Confessions of a Natural Scientist of Behavior (Updated)*



Photo courtesy of SUNY-Canton

The author in January 2012 at age 61,  
3.5 years before retirement

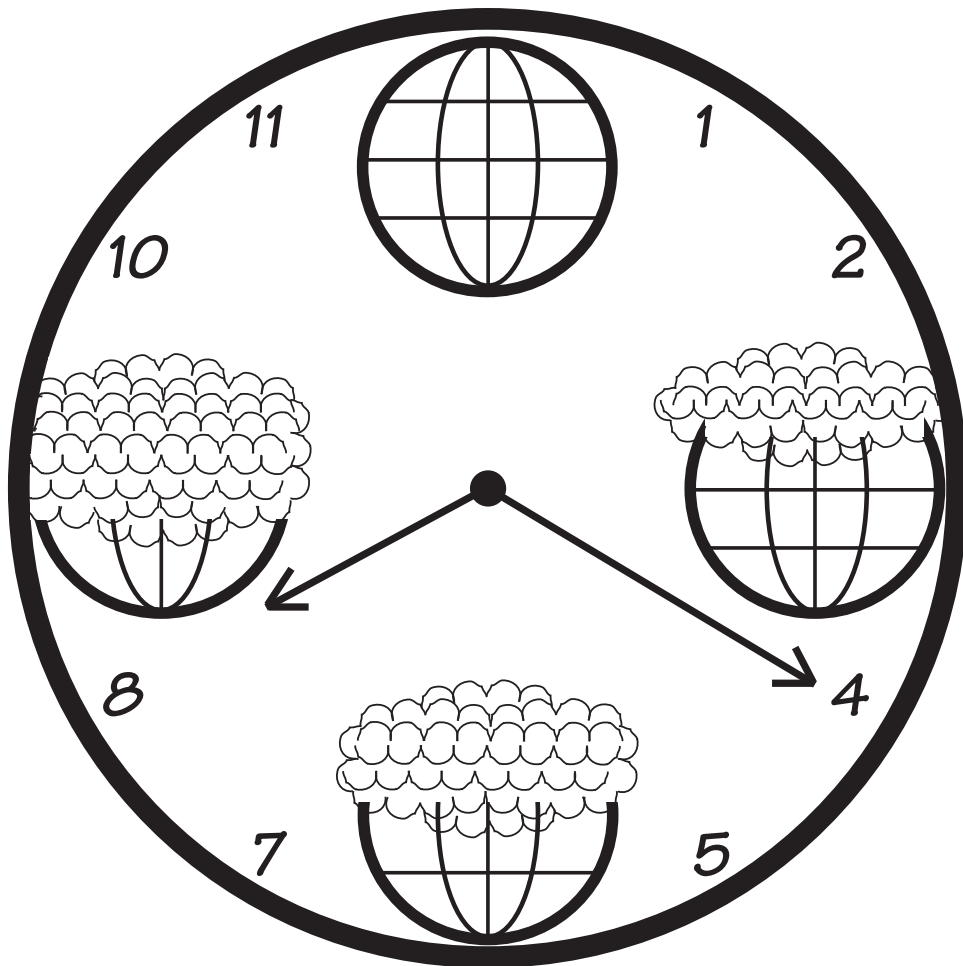
*A natural scientist of behavior provides an autobiographical account of what caused his—and can cause others’—participation in science and its beneficial applications.\**

**Stephen F. Ledoux**

*Professor Emeritus of Behaviorology, SUNY-Canton*

Published by ABCs, Los Alamos, NM, USA.

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## Running Out of Time

Stephen F. Ledoux (2013)

## Chapter 1: Introduction [traditionally called the Preface]

The appearance of many kinds of reasons over the last several years supports producing a book, or series of volumes, in which different natural–scientist–of–behavior authors tell their life stories. Applying their natural science to their autobiographies could provide examples to the wider culture of the kinds of real variables that science demonstrates as actually responsible for the behaviors, directions, and products of lives. Such examples would differ in helpful scientific ways from the far more common and, sadly, as yet little questioned magical attributions of causality to mysterious agents inside the body as the causes of the behavior, directions, and products of a life, the kind of attributions at work in most traditional biographies and autobiographies. These kinds of “inner–agent” attributions have proved quite distracting, misleading and in some ways actually harmful (as discussed in Ledoux, 2014 or 2017; cited works appear in the References at the end of each chapter). Our culture would benefit from, and should welcome, stories with real variables that can help readers understand and better deal with the world around them.

Then in February 2021, a friend reminded me that a somewhat similar book had “recently” (2017) become available. This book was the *Omnibus Edition of Behavioral Science: Tales of Inspiration, Discovery, and Service* (that R. D. Holdsambeck & H. S. Pennypacker edited). My copy arrived soon thereafter.

At first, that book looked like it might be the kind of planned, science–oriented book that those earlier–mentioned reasons support producing. As an enjoyable and informative read, it indeed tells valuable “tales of inspiration, discovery, and service.” It focuses on the life stories of many capable people in the history of the field of behavior analysis while letting some information leak out through these stories about various connections between this field and the traditional discipline of psychology. Sometimes the stories even seem a little contradictory, which is not a problem but indeed a predictable outcome of the sometimes contradictory circumstances under which these authors operated.

That book’s editors, however, had explicitly asked its authors “to tell their *first person* accounts...” (p. x, emphasis added), which they did. This made the book, while fine in its own way, a very different book from the kind of planned, science–oriented book envisioned here, the book you are holding.

The more immediate history of this autobiography helps set the stage. The original version first appeared as a ten–page “obituary” that happened as an exercise to see how difficult writing a biography would be if it focused on real variables that determined the directions and products of a life, rather than on the usual attributions to conjured, mysterious agents inside the body. That “obituary” version originally appeared as the last paper in my first book of newspaper columns (Ledoux, 2021a) where it took the place of the publisher’s usual “About the Author” piece at the end of a book. Professional feedback suggested that the exercise had succeeded, which added another reason for at least an initial volume of several authors’ autobiographies. The difficulties

in writing a “real–variables focused life story” turned out not to be so great, especially since the traditional alternative tends to sound like an advertisement for a very capable and famous commuter manufacturer (i.e., “I ...,” “I ...,” “I ...,” “I ...,” and so on). Respecting full disclosure, efforts using their computers produced not only a multi–author book of autobiographies but also this and many previous books.

Due to the success of writing that “obituary” with a focus on scientifically relevant circumstances, the effort began on a book that featured the “short” (i.e., 4 to 40 page long) autobiographies of several natural–scientist–of–behavior authors. To various extents their stories also resist the *first person* accounts. They also emphasize the scientific circumstances (i.e., the *contingencies*, the relations between the changeable, environmental independent–variable “causes” and the measurable, behavior dependent–variable “effects”) that led to, or contributed to, the conditioning of their natural–science behavior repertoires, along with the various directions, outcomes, and products of those contingencies over each author’s lifetime. Their stories tell us what led to, or contributed to, their being productive natural scientists of behavior, and you can find their inspiring stories in a book that this author had the honor to edit (see Ledoux, 2022). For this multi–author book, my mentioned “obituary” grew into a 40–page chapter.

The process of writing that chapter, however, produced more memories, documents, and graphics than would fit. Additional science–related recollections and information kept surfacing, and piling up, about other operational contingencies, developments, activities, and so on, none of which could fit into that chapter without exceeding the specified 40–page limit for that volume. But my chapter had already reached that volume’s limit.

A clear implication emerged from both having reached that limit, and having—in about 2010—come around to liking “writing” as opposed to previously only liking “having written” (as explained in “Technical Points about ... writing” later). The implication was that the time had come to confess a more fully examined and documented autobiography that broadly expanded the contents of that 40–page chapter. Ahhh, another book project to keep me busy in retirement.

That experience of having material remaining, after completing one’s chapter for the multi–author biographies book, might also be the case for some others among those authors. So do stay tuned. The chapter manuscripts for some of those authors, however, got delayed by various circumstances. As a result the original edition of this autobiography actually came out *before* the multi–author volume. After this volume the discovery of more materials and memories then produced this *updated* edition of my autobiography.

***So science enters autobiographies.*** As natural scientists of behavior, some of us use the name “behaviorology” to recognize the separate and independent disciplinary status of the natural science of behavior. This status is necessary to clarify that this discipline, with science and engineering and experimental and applied components, is separate from any discipline sporting either theological or secular types of magical, mysterious, or spontaneous causal accounts for behavior (e.g., agential causes). This independent status holds regardless of what kind of history various natural scientists of behavior have had with these



disciplines (e.g., starting out in them and/or being employed in their work units and/or being personally successful in them). And as natural scientists of behavior, we ourselves may not even be in any great need of either the CCBS kind of book or the different kind, like that multi-author autobiography book or the one you are holding.

Others, however, such as people unfamiliar with the natural science of behavior, who might be struggling against anti-science traditional cultural conditioning, might benefit from reading *how various contingencies have worked to provide society with people exhibiting this science / engineering repertoire*, making discoveries and inspiring and serving others through it. Furthermore whole disciplines such as literature and history, may benefit even more from examples of the planned different kind of writing in these stories, writing that perhaps succeeds in showing that the telling of such stories can occur without relying on the presumptuous and misleading agential worded “I” accounts that are common in traditional writing styles.

The authors in the CCBS book understand the scientific causes of behavior and presumably only use the first person—as does this writer—in its verbal-shortcut sense (i.e., to stand in for more lengthy, technically accurate, but currently cumbersome phrases like “DNA-based carbon-unit locus of contingency effects”). And readers familiar with the natural science of behavior share this understanding. But this group comprises a rather small portion of all potentially interested readers.

Unlike that CCBS multi-author autobiography book, however, this book avoids that agential trap by design, at least by resisting the first person “I” in its autobiographical story, because of its agential connotations that traditional cultural conditioning spreads widely and deeply, confounding understanding of behavior causes, often for a lifetime. Scientific educational contingencies—like those that this book might minimally provide—can help, if they are available to alleviate the agential misunderstanding.

With that background, the writing of this book occurs as evoked-response answers to evocative-stimulus questions of the kind that cultures and colleagues and students and readers provide. Stated for the record, some of the pertinent evocative-stimulus questions include these: “What happened, and what *were* you, *before* you became a natural scientist of behavior, and why (i.e., what variables caused those events and that status)?” “What caused your then becoming a natural scientist of behavior?” “What were your activities and applications and products as a natural scientist of behavior, and what caused those activities and applications and products (since “you” didn’t!)?”

As that phrasing shows, this autobiography uses some new techniques of grammar (as did my chapter and others’ in the multi-author autobiography book) that help shift away from the traditional agential perspective and toward the scientific contingency perspective. Thus this story can, by its example, show yet another—beyond the usual—serious value of this science to society. This book might inspire those who, through it, find out about this science and its scientists and practitioners, especially perhaps younger people concerned about the world. This story might interest them in the science and might even evoke their pursuing it and so being better able to help solve global problems.

***More Book Origins***

Other contingency-produced reasons also led to this book, such as originally covert thinking responses like these: “Perhaps some day a bunch of us natural scientists of behavior (e.g., behaviorologists) can put together one or more books wherein each author describes some contingency analysis—rather than first person talk—that accounts for each one’s becoming a natural scientist of behavior, along with accounting for the products of these behaviorological repertoires. Not only would this avoid overusing first-person pronouns but it would also (a) preserve some meaningful parts of the history of the natural science of behavior, (b) describe some of the successful range and extent of the various contingencies that condition currently rare behaviorology repertoires and products, (c) show, to many others in other fields of endeavor, how contingency analysis can deal with normal behavior outcomes like theirs and those about whom they write, and (d) show that contingency-analyzing autobiographies can be more accurate, meaningful, and scientifically valuable than are autobiographies based on claims of various agential causalities.”

The book also does not just focus on “how this writer came to the natural science of behavior/behaviorology.” Instead it focuses more broadly on “what contingencies, actual or coincidental, were operating that led the author in the different directions that lives typically take.” Of course, somewhere that would, and should, include appropriate details on “how this writer came to the natural science of behavior/behaviorology.”

Perhaps contact with this kind of book can shift contingencies on some others, say, in literature or history, to encourage more understanding and application of contingency analysis (and the science behind it) for work in these fields. If contingencies can induce some authors of traditionally the most agential sounding writing (i.e., autobiographies) to be less agential, then being less agential is likely within the reach of the contingencies on most authors. And books like this are part of such contingencies. The point is to show, by actual examples, that the “stories” that lend themselves the most to agential personal pronoun usage, like autobiographies, can instead not only provide contingency information, even contingency analyses, but do so without excessive recourse to reliance on agential personal pronouns while still being at least adequately interesting. Ahhh; perchance to dream. (And, if this introductory information presently bores you, skip the rest—Until later?—and get into the story, starting a couple of pages into Chapter 2.)

One might forgive traditional autobiographies for their over use of “I,” along with “me,” “my,” and “mine,” although “me,” “my,” and “mine” carry far less of the agential weight than “I” carries. So autobiographical authors need not worry as much about these pronouns. And if books like this one were *just* for people already familiar with the science, then avoiding “I” might be unnecessary. That is, authors would have less need to avoid “I” if their books were just for readers already conditioned, through various science resources, to respond only to the verbal-shortcut meaning of “I” rather than to its agential connotations. One way such conditioning happens is by the conditioned effects wrought by design in the writing and reading of books like my 2014 textbook, *Running Out of Time—Introducing Behaviorology to Help Solve global Problems*.

But books like this one are *not* just for those of us already conditioned that way. This book could have a far greater value, than just the value of the life story told in it, by its prompting readers to discover more about the science, and possibly even make careers in this science. The greater value resides initially in the example of telling a story without relying heavily on “I” (or even on passive voice, although that is one way to avoid “I”) while instead making other nouns the subject in sentences (and not necessarily always “contingencies,” although that would be OK). This value *then* resides continually in the exemplar status of the book for all those still conditioned to respond to “I” agentially (i.e., those whom the book is really for) showing that one (essentially anyone) can (be under contingencies to) write this way about any topic. In that way this book helps pave the way for a new, and needed, grammar that is more in line with scientific realities instead of being aligned—as today’s grammar is—with socially divisive agential realities of both the theological and secular types.

If behaviorologists can’t or won’t—and so don’t—show by example that such writing is possible, then who will? And why should anyone else bother? Or, more scientifically, if contingencies don’t induce behaviorologists to show by example that such writing is quite possible, then contingencies are rather unlikely either to induce such writing behavior from anyone else, or even to induce enough scientific behavior, of enough types, to solve our (i.e., humanity’s) range of global problems in the time those problems allot to us.

Hold on. Is that not a rather big leap?

Actually that is a long-acknowledged leap—see Sidman, 2021 (originally published in 1989)—and thus not so big a leap. And it shows that our concerns are far bigger than just writing autobiographies with a new grammar.

Here is a more explicit answer. Why make that new-grammar effort? Because human behavior causes global (and personal and local) problems, and humanity needs changes in human behavior to solve these problems. If humanity is to avoid repeating the errors of the last several thousand years that arise from trying to apply pre-scientific, inner-agent causality to solving problems, then addressing personal, local and global problems requires that a natural science of behavior be applied in mutually supportive ways to many levels of human interaction, including science-supporting grammar and phrasing in books.

Also, to the extent that this natural science is required to solve problems, human civilized survival, and perhaps much more, comes under increased risk if we don’t apply this natural science of behavior, especially because some global problems, like global warming, themselves set rather strict requirements on the time frame for how quickly solutions must occur. (Yet even this science is as yet poorly prepared to play its part; for one way to solve this conundrum, see the short article, “Jobs abound for contingency engineers but degree programs remain scarce,” in Ledoux 2021b, and later in *this* book.)

In support of scientific accuracy, the autobiography herein sets aside the notion of agential causality. Then it can provide an interpretative contingency analysis, based on known facts—often matters of public record but also matters of covert, neural-only responses (e.g., “memories”)—that focus on the particular known contingencies that drove the directions and behaviors of the author’s life. These “contingencies”—some little repetitions can help—

are the dependencies, the relationships, between behaviors and their “causes,” their independent variables, that thus scientifically account for the directions, products, and activities of the author’s life. (For thorough details about the range of contingency causes of all behavior, including human behavior, see Fraley, 2008, or Ledoux, 2014, or 2017, or 2021a and 2021b; for details about the emergence of the natural science of behavior, see Fraley & Ledoux, 1992/2015.)

Furthermore, traditional conditioning makes many people more easily respond as if the implied inner agents are somehow real, even respectable. Since scientifically the inner agents are neither real nor respectable, this author works to enhance accuracy by writing with other than personal kinds of sentence subjects. To be honest, this is a big part of what “some new grammar” means.

Also, the writing style, where one need not speak of oneself as “I” while also pointing out the effects of contingencies that shaped one’s repertoire, is not only possible but necessary. Not using it could prevent the science from being available to help some of those who stand to gain the most from the science. This could include those whose traditional cultural conditioning still makes them see the “no-‘I’ style” as repetitive, and possibly contradictory because, as they might mistakenly say, “the ‘I’ is already the cause, so you don’t really need to discuss contingencies as the cause...”

For such reasons we make efforts to write, even autobiographies, with less agentialism. Someday society will likely take behaviorological science for granted (as it does physics, chemistry, biology, and so on) and relegate agentialism (some say “agentism”) to a footnote in history’s dust bin. Then, that style (i.e., “not speaking of oneself as ‘I’ while also pointing out the effects of contingencies that shaped one’s repertoire”) can safely become common.

Thus, the contingencies involving such considerations induce my observing that the contents of these discussions show (a) that a far greater need exists for these kinds of books than we previously thought, and (b) that the exercise can be as helpful to us as to people in general, and perhaps to those in literature and history in particular. (More information about “new grammar” appears in the Appendices.)

### ***Some Disclosures***

Respecting full disclosure, specifying some parameters can clarify for readers how some things get done in this volume: The audience for this book is the general readership of the culture and “for the record,” which can require some citations and references to other sources. This book follows a standard pattern of citations—in the text of each chapter, as “author, year”—with full references for the cited works at the end of each chapter. Given the general-audience nature of this book, this author tries to keep citations/references to a minimum. Readers can find more resources in the “Recommended Basic Readings” and the “...Short Bibliography,” at the end of the book, as well as in other related books and on professional websites such as on the JOURNAL, SPECIFIC ARTICLES, and BOOKS pages at [www.behaviorology.org](http://www.behaviorology.org), which is the website of The International Behaviorology Institute (TIBI). While TIBI does not sell books, it does provide full descriptions of many behaviorology titles, including where to find them (e.g., at [www.lulu.com](http://www.lulu.com), which *does* sell books).

References, from citations, usually appear in footnotes. This book, however, avoids footnotes, because footnotes—at chapter ends or at the back of the book—often drive readers crazy. Instead, any “footnote materials” get put into the text, perhaps in parentheses or in “As an aside...” paragraphs.

As an aside, many photographs appear across the pages of this book. If the photographer’s name is available, then it appears in the attribution note (along the side of the photograph) except for many of the photographs that the author took. (The author’s photographs have not undergone any alteration.)

Sometimes this book needs to touch on various principles or practices of behaviorological science about which some readers could be unfamiliar. In such cases the author provides readers with brief summaries of those principles or practices, supported with citations and references to available, appropriately leveled materials. The BOOKS page at [www.behaviorology.org](http://www.behaviorology.org) features several books that “introduce” behaviorology, ranging from a doctoral–level book (Fraleay, 2008) to a textbook for majors or graduate students (Ledoux, 2014) to a general–audience primer (Ledoux, 2017) to books of newspaper columns (Ledoux, 2021a, 2021b). For your convenience this updated version of this autobiography includes, at the back, a “List of Documents and Pictures” and an “Index” to make finding something again in the book easier. In a second set of Appendices, this book also includes the *Tables of Contents* of the author’s various resource books, which can help in finding more information.

Readers can direct any mail correspondence regarding this book to the author at 26 Timber Ridge Road, Los Alamos NM 87544. Readers can also contact the author through the free–access (i.e., no ads) interactive comments feature of the [www.BehaviorInfo.com](http://www.BehaviorInfo.com) website that finally got up and running after the delays—due to the ongoing 2020 pandemic—abated. This website accumulates my 144 newspaper columns on the natural science of behavior in two sets of 72 columns each, one set each on basic and advanced topics.

Again, understanding “contingencies” is important to a sensible reading of this autobiography, as is grasping the scientifically sound, non–agential, “verbal–shortcut” use of personal pronouns, like “I” or “me” or “she.” Both topics get further explained in some of my books, sometimes in non–technical terms. The best one for this overall topic might be my 2017 book, *What Causes Human Behavior—Stars, Selves, or Contingencies?* which is a general–audience primer on the natural science of human behavior. (If you prefer a primer that covers non–human behavior, contact Direct Book Services at 800–776–2665. They will likely answer the phone with “Dogwise,” because one of their long–standing and most popular specialties involves books about our canine friends. Many of their companion–animal training books—especially those by James O’Heare—already specifically apply the laws of behavior that several of my books systematically cover in detail.)

### **Summary**

The new grammar that the efforts for scientific accuracy require has only recently begun to appear. And helping solve problems provides good reasons for trying to expand exposure to a scientifically more accurate grammar. Another reason concerns all the damage done by traditional grammar.



Educational contingencies (e.g., some exposure to the natural science of behavior, which is neither a part of nor any kind of psychology) have not yet enabled the vast majority of potential readers to become familiar with the purely “verbal–shortcut” status of the personal pronouns. Remember, scientifically these pronouns stand best as verbal shortcuts for more lengthy, technically accurate, but currently cumbersome phrases like “DNA–based carbon–unit locus of contingency effects,” which is a reasonable if less exciting way to describe what “we” all are. Instead, traditional grammar allows each of these pronouns (e.g., the first–person singular pronouns, “I,” “me,” “my,” and “mine,” and first–person plural pronouns like “we”) to imply the existence of one or another superstitious theological or secular inner causal agent of human behavior. Thus the traditional grammar continues coincidentally to support perhaps the most insidious and long–standing anti–science error in human intellectual history, an error only discovered in the last hundred years with the emergence of the natural science of behavior, an error about the origins, the causes, of behavior, including human behavior.

That error occurs through the traditional cultural conditioning, which happens during everyone’s unquestioned childhood upbringing, that compels people to believe—often for their whole lives—various versions of the age–old but false pre–scientific and anti–scientific notion that inner agents (e.g., minds, souls, psyches, selves, and so on) cause human behavior. And this error misdirects vital efforts to understand, predict, and change human behavior.

Today, however, humanity can ill afford the delays in dealing with human behavior that result from that misdirection, because human behavior remains at the root of the causes of humanity’s global problems, and changes in human behavior remain needed to solve those problems, all while the problems themselves give humanity a shrinking time frame in which to solve them. Humanity is thus running out of time. So humanity benefits from welcoming any and all occasions to reduce the agential misdirection regarding human behavior by increasing examples of scientific accuracy even through new grammar usages, such as those that this autobiography employs.✿

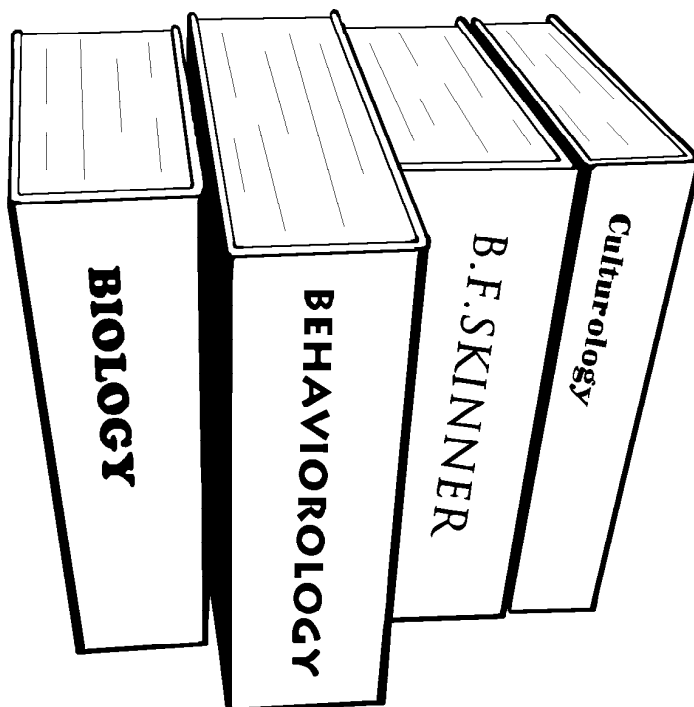
## References (with some annotations)

### Mentioned in This Chapter

**NOTE:** *Many of the books listed in the References at the end of each chapter in this book are available through green “Print–On–Demand” from [www.lulu.com](http://www.lulu.com) (click the magnifying glass and enter an author’s name). They also have full descriptions on the books page of [www.behaviorology.org](http://www.behaviorology.org) and some may be available in digital formats... (The rest of this NOTE appears only on page xiii in the Foreword. You did read the Foreword, didn’t you? It’s as much fun as some other parts of this book!)*



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Behaviorology in its immediate scientific neighborhood

## ***Chapter 2: Discovering Existence***

A couple pages of repeated *but enhanced* points can save readers time and effort later. Throughout this autobiography the “bigger picture” connects the problems of traditional but incorrect explanations of human behavior with the solutions of current and expanding natural–science explanations of behavior. This connection then extends through considerations of developing the natural science of behavior, along with some science–supporting new grammar, and sharing the science to help solve the behavior components of global problems, all via an autobiographic literary device. The *details* herein, however, describe the autobiography, not the connections. Thus we now offer a little repetition to help clarify these connections.

This autobiography began as an exercise in scientifically accurate writing about someone’s life. This search for scientific accuracy includes avoiding the usual, misleading and incorrect chatter or implications about life’s activities, directions, and products happening due to inner behavior–causing agents, including those implied by personal pronouns such as “I” that often pervade traditional biographical efforts (“auto” or not). Using “I” too easily misleads many readers regarding the actual “causes” that produced these components of a life. While not without problems, other pronouns (e.g., “me,” “my,” “mine,” and so on) seem easier to manage. (To reduce this problem *before* proceeding, consult one of these books: For a textbook that gradually but explicitly, by design, conditions readers to experience fewer agential problems and to respond to personal pronouns correctly as “verbal shortcuts,” see my 2014 textbook. For a book that does not manage the job quite as well but is less technical, and so is easier to read, but also less comprehensive, see my 2017 general–audience book.)

That effort for scientific accuracy does *not* occur for fun. Rather it occurs to support efforts to make a better world (as Chapter 1 described). And it carries certain risks in that, while it helps all readers in the long run, it bothers some readers in the short run. Are you one of them? Please trust me a while longer to see that putting up with it is worth the effort. Good reasons exist for trying to expand exposure to a grammar more supportive of scientific accuracy. One reason concerns the damage done by traditional grammar.

### ***Some Repeated Details that Reduce Potential Problems***

Some educational contingencies share the natural science of behavior, a science that some people call “behaviorology.” And this science is neither a part of nor any kind of psychology. These educational contingencies have to date only been available to help a small percentage of potential readers become familiar with the purely “verbal–shortcut” status of the personal pronouns. Traditional grammar allows each of the pronouns (e.g., the pronouns “I,” “me,” “my,” and “mine”) to imply the existence of one or another superstitious theological or secular inner agent (e.g., a mind, psyche, soul, self, and so on) as the cause of human behavior. Thus the traditional grammar continues coincidentally to support perhaps the most insidious and long–standing anti–science error in human intellectual history, an error only discovered in the last hundred years

(see Ledoux, 2012) with the emergence of the natural science of behavior (see Fraley & Ledoux, 1992/2015), an error about the causes of behavior, especially human behavior, the error of behavior-causing inner agents.

That error occurs through the *traditional* cultural conditioning that happens during each person's childhood upbringing, a period during which questioning this conditioning is, for basic biological reasons, quite unlikely to occur (e.g., the verbal behavior of young children, which occurs through a wide range of conditioning effects, is just beginning to happen, so children's asking for cookies is far more likely than their asking about the accuracy of the cultural beliefs that the people around them are conditioning; see Peterson & Ledoux, 2014, for a scientific introduction to verbal behavior). This traditional cultural conditioning compels children to believe—into adulthood and often for their whole lives—various versions, both theological and secular, of the age-old but false pre-scientific and anti-scientific notion that various inner agents cause human behavior (again, e.g., minds, souls, psyches, selves, personalities, choosers, deciders, and so on). And this error misdirects vital efforts to understand, predict, and change human behavior, with harmful implications right up to misinforming, and so delaying, our solving of global problems.

Today, however, humanity can ill afford the delays in dealing with human behavior that result from that misdirection, because human behavior remains at the root of the causes of humanity's global problems, and changes in human behavior remain needed to solve those problems, all while the problems give humanity less and less time in which to solve them. *Humanity is thus running out of time.* So humanity benefits from welcoming any and all occasions to reduce the agential misdirection regarding human behavior. Increasing science education, and examples of scientific accuracy, even through new grammar usages, can help.

In support of scientific accuracy—in this case, accuracy in scientifically accounting for the behaviors of the author's life—this book sets aside that damaging notion of agential causality. Then, often with other kinds of sentence subjects, it applies interpretative contingency analysis, based on known facts, matters of both public record and private, neural-only responses. (Neural-only responses include the new responses called “memories” that are new behaviors occasioned by current stimuli that differ from the stimuli that occasioned the original “remembered” responses. These neural-only responses are first known only by the body in which stimuli evoke their occurrence.) These neural-only “memory” responses focus on some of the particular known contingencies that drove the activities, directions, and products of the life under study.

But wait. Really, what are “contingencies?” Basically “contingencies” are the dependencies, the relationships, between behaviors, overt or covert, and their “causes,” the behaviors' independent variables, that thus scientifically account for all behavior including the directions, activities, and products of a life. An understanding of “contingencies” helps people make appropriate sense of this autobiography, and of the world's phenomena. The same benefit occurs from grasping the scientifically sound, non-agential, “verbal-shortcut” use of personal pronouns, like “I” (where, as a verbal shortcut, “I” replaces more lengthy, technically accurate, but quite cumbersome phrases like “DNA-based

carbon–unit locus of contingency effects”). Both topics get further explained, in non–technical terms, in some of my books. (For thorough details about the range of contingency causes of all behavior, see Ledoux, 2014, or 2017, or 2021a and 2021b. In a substantive manner, these materials fill out this story.)

On the other hand, sometimes contingencies induce lots of activity, including perhaps lots of emotional activity. And then they pass, leaving no solid evidence of value for outside observers. Such contingencies seem to make little difference in overall directions and behaviors (including “memories”) in a life, and so these kinds of contingencies tend to go unreported in this narrative. For example, except for here *as an example*, or perhaps later as a joke, my appreciation of dark chocolate—especially Hershey’s Special Dark—will not be worth repeating.

Meanwhile, herein the phrasing tries to help readers gradually feel more comfortable—if they don’t yet feel that way—with non–agential, verbal–shortcut pronouns (as described in Chapter 1). The phrasing most often invokes “me” and “my,” and may even throw in an occasional “I” (yes, in quotation marks) that prompts readers to try out the verbal–shortcut status of these pronouns as used non–agentially.

### ***The Story Begins with These Early Formations***

The birth of the male, DNA–based carbon–unit locus of contingency effects (Oh, how cumbersome!), a member of the possibly misnamed “Homo Sapiens” species, whose parents named him Stephen Ledoux (pronounced “*la-dew*”) occurred in late August 1950 CE. (Following AARP—American Association of Retired Persons—recommendations for protecting identities, some details remain unreported.) Originally, both parents, an older brother, and two older sisters already populated the home. We all then lived in Sacramento, California (USA). Later, two more brothers and three more sisters joined the family, for a total of nine children. (My mother collected several pages of information on my early growth and standard activities. These appear in the Appendices.)

When about six years old (see the photo) my father said of me that, as the fourth–born child in the family, “he was Chinese” because, as he understood the statistics at the time, “every fourth person on the planet was Chinese.” This initial connection with China grew and possibly contributed to my later China interests and travels (e.g., see Case & Ledoux, 1997).

The traditional cultural conditioning of this new, young human’s repertoire—the full, usually growing and changing repertoire, which natural scientists of behavior call the “person”—derived mostly from the common contingencies operating in, and implied by, the working–class social, political, and religious (i.e., Catholic) spheres in the USA in the 1950s. While any sociologist can expound at length on the range of effects likely from such a combination of contingencies (although the concept of contingencies itself may perhaps elude them) such traditional cultural contingencies remain unquestioned among children and often continue to affect their behavior repertoire across the lifespan, unless other contingencies—such a those in education, particularly science education, especially behavior–science education—induce the appropriate challenges. In my case some of these contingencies had additional,





Photo by Lawrence G. LeDoux

**My mother (top left) and grandmother  
with me (lower right) at age 6, with three siblings**

usually negative effects that disrupted the seemingly innocent flow of later developments. In due time these will all get some attention.

In the 1960s other contingencies affecting my repertoire stemmed from the entertainment industry—with television programs like *Star Trek*—trying to benefit from, and possibly even support, society’s Sputnik-induced growing interest in science. The Gemini and Apollo programs of the National Aeronautics and Space Administration (NASA) that put people in orbit, and landed people on the Moon, occurred mostly in the 1960s. The experienced sense of increased emphasis on considered logic over excess emotional reactions, as again introduced to the culture by the fictional *Star Trek* character, “Spock,” affected me, an audience member in my teens, along with many people.

Most of those 1950s contingencies, particularly the religious ones, also included my attending a Catholic elementary school for grades one through eight (my graduating Diploma is in the Appendices). Many secular and religious activities developed in these circumstances. One secular activity resulted from a recommendation from the nun who was my sixth-grade teacher. This led to my being selected to get to spend a free week at a civic summer camp, Camp Sacramento, in the Sierra Nevada mountains. This was my turn, after she had also recommended a couple of my siblings in sequence over a few years, and none of us would otherwise have gotten this experience, because this family with ultimately nine siblings simply could not stretch the dollars that far. In



the same time frame, one religious activity that should occasion no surprise included my serving as an altar boy in the local parish, and then going on to complete four years of high school at *St. Pius X Seminary* (in Galt, CA, which was situated in the country 25 miles south of Sacramento) in June 1968 (this graduating Diploma is also in the Appendices). However, the “good-side” stuff does get some “balance.”

**A “learning–experience” project before high school.** A project at around age 12 proved to be more of a “learning experience” than anyone might have anticipated. My dad had helped my maternal grandfather produce a camping tent, called a “Quick Camp,” which my grandfather had invented, that used some standard pipes and fittings to enable it to set up quickly and easily by unfolding after swinging down from on top of one’s car after arrival at a campsite. Sadly, my only real recollection about the Quick Camp stemmed from around age four with several siblings. While we played in one, someone thought zipping shut the door, with no light inside, was funny. It wasn’t.

All that about the Quick Camp, however, mainly explains why my age–12 project became possible, because my dad had lots of leftover old pipes and fittings that he kept under the workbench in the garage. Also, my paper route (described elsewhere) provided me with lots of experience with rubber bands and rubber–band chains. This availability of pipes/fittings and rubber bands led where no one should probably have ever gone. Some pipes and fittings made a four–foot tall “stand” with a foot–wide “U” shaped fork at the top (with all these measurements being “memory–dependent” approximations). Adding, to the top of each fork tine, a two–foot–long rubber–band chain, with each link made of six rubber bands, with a four–inch–square leather patch in the middle to hold walnuts, provided “us”—me, my younger brother, and some neighborhood friends—with one really giant slingshot.

Then the “fun” began. They helped me use the slingshot as a really big, fancy nutcracker by, with each shot, lobbing a walnut over multiple neighborhood houses. Could it crack those nuts! Some neighbors, however, proved less able to see the value of a giant nutcracker leaving cracked walnuts on their roofs. They were of course right. Meanwhile, my brother and friends disappeared when two officers in a police cruiser stopped by supposedly to ask how those walnuts were getting so far from their tree.

To apologize to one neighbor who objected to his roof providing the landing strip for some walnuts (pardon the shift to an aviation metaphor, but those walnut *were* really flying) the officers gave me a free cruiser ride. This ride—so far my only one ever—taught me several things. Besides the obvious safety and legal lessons, it taught me to avoid rides in the back seat of police cars, because the doors have no handle for getting out...! (Did you know that?)

**On to high school.** My years at St. Pius included several extracurricular activities. One of these involved “volunteering” (i.e., the responsible contingencies remain unknown) for training to give haircuts to other students. As a boy’s boarding school where home visits occurred several months apart, such a service was needed (and the small charge collected for each haircut went to the “missions”). This skill proved helpful throughout my life because, while my own hair was out of reach, my son always came to me for his haircuts

whenever he lived at or near home. Other students also occasionally paid me a small fee to iron their long-sleeved shirts. My older sisters, for whom “long-sleeved shirts” had the status of a cuss word, had made sure to teach me such ironing tasks. In keeping with my developing (pun intended) interest (described elsewhere) in everything photographic, as another extracurricular activity, using the school’s darkroom led to some basic skills in handling chemicals, developing black and white films, and printing photos from them; presumably, none of these have survived.

For another activity my entry into a school-wide poetry contest in my junior year won first place, but little more poetry happened, due to competing interests. Still, sharing that poem remains fun such as, the last time, when it went to the staff at the Los Alamos Senior Citizen Center who sought short stories or poems to share with the members (see the letter to them containing the poem in the Appendices).

Did that contest result bias me toward undertaking a particular arts-related, senior-year project? Our English teacher, Fr. Nick Freund, who was also our music teacher, set an assignment that each of us prepare, and present in class, the combination of a poem and a “matching” piece of music. My combination presented my dramatically reading the poem, “may i feel said he” by E. E. Cummings (google it, or see Cummings, 1965, p. 96) while the class listened to a recording of *Herb Alpert and The Tijuana Brass* playing “Love Potion #9” (e.g., see—or listen to—Alpert, 1987). Interestingly, this combination scandalized my classmates, apparently not so much due to the content but because they never expected such a selection or performance from me. Try it!

Yet another more official extracurricular activity involved completing target training courses in both rifle and pistol through the school’s Rifle and Pistol Club, using the school’s rifle range in the far corner of the 40-acre campus (see the photo of earned awards, which apparently served as intermittent reinforcers, with a couple of the related certificates in the Appendices).

As an aside, sometimes the events and circumstances described herein might evoke concerned-reader comments like, “You really think reporting that is necessary? It could even elicit negative emotional reactions from some people.” Well, yes, it might.

Yet it also might help some people better understand the importance of building the broadest coalition for scientifically supporting solutions to global problems. For example, if some of those who support scientifically solving global problems don’t like high schools having rifle and pistol clubs, and so mistreat those who have no problem with high schools having rifle and pistol clubs, and so drive them away from the ranks of those who support scientifically solving global problems, then humanity will lose some of the support it needs to scientifically solve global problems in the time frame that the problems allow us. Humanity can manage any important concerns behind such differences *after* solving global problems. If we allow such concerns to have a higher priority than solving global problems, we may not have a culture, a species, a world in which those concerns can ever be considered.

So, my reporting of such events and circumstances as high schools with rifle and pistol clubs not only respects basic honesty but it also demonstrates



**St. Pius X Seminary Rifle & Pistol Club awards  
earned between 1964 and 1968**

some of the range of contingencies that have affected my behavior, not only specific contingencies like those surrounding high school clubs, but far more complicated and vital ones like those surrounding human efforts at reducing threats to human existence. That helps us all stay sensitive to the full range of contingencies and their effects on both my behavior and yours. More importantly this full range of contingencies and effects reminds us all that we cannot let our conditioned differences—and they really are all “merely” conditioned differences—drive anyone away from the sciences, especially the natural science of behavior. Knowing more about it is so necessary for our collective future, because human behavior causes our global problems and we need changes in human behavior to solve these problems (yes, a little repetition like that cannot really hurt, and will likely occur again; see the references for resources with details about the necessary science).

Returning to the main story, the earlier summer–camp experience later contributed to summer jobs as a camp counselor. These were not at Camp Sacramento but at other camps. One was at Camp Pendola, also in the Sierra Nevada mountains, and another was at the Courtland Day Camp in, if memory serves, the Sacramento River delta. Other early jobs included a stint as a busboy/dishwasher at a local “Mel’s Diner” in Sacramento. My experience on that job helped with, or accrued from, the standard practice of organized, rotating groups of students taking turns clearing tables and running the commercial–scale dishwasher attached to my high school dining room.

Later, for another summer job, as a “grave digger” at an old cemetery in Sacramento around 1970, no experience was required. A union job, with union wages at the time of \$3.50 an hour (when minimum wage was closer to \$1.25)

the actual duties were much less “romantic.” The cemetery contained individual raised plot squares—enough for three or four grave sites—all surrounded by concrete sides that made using big commercial gang-style lawn mowers quite impossible. Instead, a small home-size mower had to be maneuvered carefully across plot boundaries to access the grass for mowing. Even graves had to be dug by hand, because the usual backhoe also could not easily maneuver on the raised, concrete-sided plots.

One particular, and creepy, cemetery memory stands out. One day while watering a plot—all these raised plots also had to be hand watered—the upside-down flower holder began rising up, higher and higher! Was anyone coming up with it? Spooky! Why was this happening? Then it fell over, and no one “else” was there. Simple physics were at work, of course, for the water was filling the holder’s casing. And the rising water level was forcing the upside-down but air-filled flower holder to rise up quite secularly.

Perhaps other types of summer jobs came my way as well. But if so, who can remember them all? Not me.

Other aspects of seminary life are likely responsible for later behavior characteristics. For example the fire-alarm-equivalent bell that rang at 5:50 AM every morning for four academic years likely conditioned my life-long ability to awaken instantly and thoroughly upon any alarm sounding, something that served me well later when, as student or teacher, my first class of the day began at 8 AM!

My summer work between those academic years enabled different kinds of reinforced responses as one of a very small—less than three or four—crew hired to maintain the campus grounds in a well watered, green condition during the dry California summer heat. All the exercise from that work, with plenty of big, long sprinkler pipes to move every day, also helped keep me physically healthy. And the evenings—off time—remember, this work required living at the school during these summers—kept me intellectually healthy, with the library doors unlocked so anyone on the crew could indulge their reading pleasure. In my case this meant getting to read many volumes on archeology and anthropology plus other volumes in the natural sciences (e.g., astronomy, geology, biology).

One could consider other seminary-life conditions as unhealthy to some extent. For my first year, our extra-large freshman class occupied cramped quarters. We lived in several large dormitory rooms, each designed to hold ten beds with a narrow chest of drawers and a tall locker as a “closet” for each student. For our large class, however, each 20 of us shared each of these rooms. While doubling the chests and lockers took up little space, doubling the beds with bunk beds made the room somewhat crowded and noisy. Many of these metal bunk beds were rather rickety affairs and all of them squeaked noisily at night. This characteristic quickly taught us to sleep through nearly every kind of nighttime noise—except that nasty morning bell—due to the jagged creaks and scraping squeals that occurred upon the slightest movement of either occupant in any of the ten bunk-bed pairs in the room.

What a “symphony” to get used to, but we did. As an extra benefit, the bottom-bunk dwellers, including me, gradually achieved a special faith about life, even claustrophobic life, while surviving this location. As another hard-won benefit, these beds also conditioned many of us to sleep with only small,



careful, QUIET movements, often leaving beds fairly unruffled by morning. For me at least, this became a life-long practice and benefit.

Over time, the bunk-bed condition decreased as the class size gradually shrank. Students went elsewhere to continue their high school education. The class of 20 who remained to graduate in June of 1968 started out with a number a couple of times larger. (Don't ask for exact numbers. Who can remember? And the Diocese of Sacramento closed the school years ago, selling it to, if memory serves, the California Highway Patrol.)

Perhaps due to the predictable desensitization to noise, the morning 5:50 AM bell, originally loud enough to wake the dead, *seemed* to decrease in intensity over the years. But each morning, by 6:30 AM, most students had cleaned up and made their way through the long hallways to the chapel. Those who were tardy got to sweep those hallways later. (Ahhhh, more contingencies...)

Recognize, however, that the overall design for each *pair* of those dorm rooms proved quite uncooperative with the doubling of occupant numbers. Why? Because the space between each pair of dorm rooms contained the shower, sink, and toilet facilities, and these did not multiply with the increased occupant numbers! As one inescapable complication, these facilities included just six showers. Yes, just six.

Imagine the morning stress with just these six showers having to serve the needs of the 40 teenage boys—20 in each connected bunk-bed dorm room—roused by THE BELL every morning, with essentially only 40 minutes for them all to get done (You do the math.) and be in the chapel, a long corridor walk from the dorm rooms, by 6:30 AM. And of course all this happened in typical seminary *silence!* At least the chapel activity was short, followed by breakfast.

While we had come to deal effectively with such conditions, some added relief occurred as we moved from the dorm rooms to “semiprivate” rooms (i.e., two students per room) for our junior and senior years. One might wonder how this kind of change might have affected grades.

Like virtually every other high school, mine had the usual in-house sports teams. Everyone played football and basketball and soccer in season, not always willingly, or well. We did have at least one team that occasionally competed off campus against other schools, the riflery team. Later, as a faculty member at the school in the spring of 1972, the principal assigned me to be the team's advisor and coach. Did we win any matches? Honestly, who can remember?

Along with the distinctly secular activities, including the mentioned aspects of seminary life and the high school seminary Rifle and Pistol Club, the theological activities at the time also remained pertinent to me. These activities enmeshed and enthralled me as much as the doctrinal claims and ceremonial pageantry of the religious contingencies, and all their trappings, could manage.

On the other hand, the contingencies inherent in this college-prep education also induced healthy repertoires both of respect for academic studies and of concern for the welfare of other people. Moving with the usual trend, my next step was to attend the college seminary, St. Patrick's College (in Mt. View, CA) for two years. There these repertoires expanded, with a default focus on studying the psychology discipline—as the only offered although incomplete option—as a means to help others.



**A photo taken sometime  
from the late 1960s  
to the early 1970s**

At that point some increasingly salient and evolving contingencies interrupted what might otherwise have been a straight line to a vocation—a common religious euphemism for a career—as a parish priest. These other contingencies involved the social disruption and unofficial education stemming from the war for capitalist imperialism—the year was 1970—in Vietnam. For example, to attend my first anti-war rally, in San Francisco's Golden Gate Park, with the black-looking Huey helicopters flying around, the driver of my ride was the St. Patrick's College president...

Consideration of the war-prompted disruptions caused many students to raise questions about various concerns, including about the whole priestly vocation thing.

Many seminarians were leaving the seminary and completing their educations elsewhere under an added contingency that the seminary college at the time only offered a "Bachelor of Arts in Humanities" degree. This degree would not be as helpful in finding a job, if that became needed because one later left the seminary, as would be a more explicit disciplinary degree. The combination of these contingencies led me "temporarily" to leave the seminary college. This move later became permanent.

That move also left me draftable for military service, but that did not happen (due to a high draft lottery number that was never reached). Contingencies had not conditioned any strong, preconceived notions about military service one way or another, even though my father had served in the Army Air Force during World War Two. As with many people of the time, however, the contingencies around me had conditioned thinking that supporting the Vietnam war was unpatriotic.

With local Air Force Base open-house days having been a popular childhood activity, flying would turn out to be a different matter. For years during elementary school, long before the opportunity for any flying or pilot training, my collecting activities revolved around transferring newspaper aircraft articles, especially articles about experimental aircraft, into a scrapbook (which, sadly, disappeared decades ago). After all, these were the days of Chuck Yeager and experimental aircraft (e.g., the X-1 through the X-15).

Not everything was wonderful in the early years of my life, and some events and circumstances (i.e., some contingencies) extended their effects into the near, and decades away, future. Sociologists have well studied the phenomena of what outcomes can happen when big families like mine, in this time frame, with a total of nine children, have resources that, by some



criteria, are insufficient to get by (e.g., those of us in the family who continued our education after high school generally paid for it out of our own pockets, through “work study” and loans). One worrisome outcome of the inherently stressful “large family, few resources” scenario involves an increased propensity to rely on corporal punishment as a major child-rearing practice, perhaps exacerbated by cultural and religious views supportive of the “spare the rod, spoil the child” notion. Such support stands in opposition to the scientifically well known but culturally under-appreciated fact that coercive practices, while contradicting best practices (e.g., “catch them being good”), lead to children (or anyone) escaping, avoiding, and countercoercing or, less technically stated, to getting away, staying away, and getting even (e.g., see Latham, 1999).

In my case the aversive home circumstances probably became a major factor in my attending a *boarding* high school away from home, which provided a sizeable escape from those circumstances. While the more subjective, “emic” account of my boarding-school attendance attributes it to a growing priestly vocation, the more objective, “etic” account would attribute my boarding-school attendance to successfully escaping some aversive home circumstances. (For details on understanding the “emic” and “etic” distinction, see some books by Marvin Harris in the references.)

In addition the resulting good education, from *all* aspects of the four years of boarding high school, fortunately seems to have overcome the otherwise predictably unpromising contingencies in my working-class social, political, and religious (i.e., Catholic) upbringing, at least with respect to later accomplishments. That is, without this boarding-school experience, my later life experiences and productivity would probably have been much different, and likely of less value to others, than the further education and the teaching and writing career that actually transpired.

Those aversive home circumstances also affected others among my siblings, and in different ways, some of which became generational. As is typical in life, not only did my parents’ child-rearing practices occur as the best outcome of their own traditional cultural conditioning (including religion), education, and experience but, as is also typical in life, these practices set the example for most of my siblings when they began to raise families. One of my sisters, however, raised objections. While my residence was thousands of miles away (More escaping?) she lived in the same city as most of the other siblings. So she could not help but observe the continuation of the coercive parenting practices during family gatherings. No one worried about her observing, but when she had the temerity, in their view, to object, and worse (again in their view) to point out that easier, better, and scientifically grounded practices had become available that they too could use, well, they denied that anything of concern was occurring and severely ostracized her for speaking up.

That reaction to her trying-to-help action cannot really be justified, since she was right. Of course, the predictable and actual outcome of my supporting her, and her action, was my being ostracized too, something that was easier for me to handle, being so far away (Definitely good escaping!). Assisting her writing a short book, using authorial pseudonyms, about the situation became part of helping her deal with this situation (L’Dew & Leedo, 1999).

As another behavior–related variable typical of the times, my Boy Scout membership (1961–1964?) had various effects on me under this organization’s range of sometimes ill–informed “character–building” contingencies. While my escape from the negative effects of the ill–informed contingencies occurred through education and experience decades ago, one lasting positive effect stemmed from the Scout’s “be prepared” contingency training. In part, “being prepared” prompted my move to leave the seminary.

Continuing under the “be prepared” training led me to attend my local college, California State University Sacramento (csus) for the last two years of my undergraduate degree, earning my BA in June 1972. This degree, while “officially” in psychology, was actually more in “behavior analysis,” which was then a relatively new name for the *natural* science of behavior (which psychology is not), a natural science that was, merely due to some coincidences of history, operating from within psychology. (My BA–degree diploma would be in the Appendices if it had not “gone walkabout” during some change of residence over the last 50 years.)

Let’s clarify that historical situation a little. While psychology uses some scientific methods, it has always refused, as a discipline, to accept even the most fundamental starting point to which all *natural* sciences adhere, namely that they all deal *only* with real, natural events as “causes” and “effects” (i.e., as independent and dependent variables). The natural sciences do not grant credit to superstitious, magical, mysterious, spontaneous, conjured causes such as an inner agential behavior causes, like minds, psyches, souls, selves, and so on. And some natural scientists of behavior have always existed “in psychology.” They have consistently produced the needed reams of experimental data as the appropriate evidence that should have changed psychology long ago into a natural science of behavior if psychology were operating as any kind of natural science, which it isn’t.

As this autobiography describes later, part of those developments occurred due to some activities that contingencies conditioned on my part. When psychology refused, again *as a discipline* (i.e., not as *individual* psychologists, because contingencies have made most of them work to help others as best they can, some with natural science) to become a natural science, many natural scientists of behavior moved outside psychology, starting in the late 1970s, as a separate and independent discipline. Its early name was “The Experimental Analysis of Behavior (TEAB) and when they began moving out they also had begun calling it “Behavior Analysis.” By 1987 some of these behavior analysts had moved even further along and adopted the label “behaviorology” for this already decades–old discipline. And this label has become the best name for this discipline over the last 35 years, because psychology has tainted the otherwise quite appropriate “behavior analysis” label by publicly claiming, and so misleading the public, that behavior analysis names a part of psychology. (For details, see Fraley & Ledoux, 1992/2015.)

In any case my studies at St. Patrick’s College had actually already accumulated most of the traditional psychology credits needed for the official csus psychology major. This contingency left me open to being able to take

most of my remaining major course credits in any of a number of areas that department faculty offered. But which area should/could/would this writer emphasize? Or more honestly and accurately, which of these areas would the accumulating contingencies induce me to emphasize?✿

## References (with some annotations) Mentioned in This Chapter

**NOTE:** *Many of the books listed in the References at the end of each chapter in this book are available “Print–On–Demand” from [www.lulu.com](http://www.lulu.com) (click the magnifying glass and enter an author’s name). They also have full descriptions on the books page of [www.behaviorology.org](http://www.behaviorology.org) and some may be available in digital formats... (The rest of this NOTE appears on page xiii in the Foreword. You did read the Foreword, didn’t you? It’s as much fun as some other parts of this book!)*

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- Ledoux, S. F. (2021b). *Science Is Lovable—Volume 2 of Explaining Mysteries of Living (Expanded)*. Los Alamos, NM: ABCs. This book features 72 more newspaper columns that cover deeper topics in behaviorology, including some initial scientific answers to some of humanity’s ancient—and as yet inadequately answered—questions such as on values, rights, ethics, morals, language, consciousness, personhood, life, death, and reality, along with several more recent topics including the *Law of Cumulative Complexity*, robotics, evolutions, and experimental and applied research methods with examples, plus three column–supporting papers and color graphics. An earlier edition lacking the color graphics and supporting papers remains available at [www.lulu.com](http://www.lulu.com).
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