

**Less–Traveled Roads—
Circumstances that Produced
Natural Scientists of Behavior**



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.

Less-Traveled Roads— Circumstances that Produced Natural Scientists of Behavior

*Several natural scientists of behavior
provide autobiographical accounts of
what caused their participation in
science & its beneficial applications.✿*

Edited by Stephen F. Ledoux

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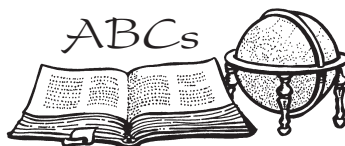
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Less-Traveled Roads— Circumstances that Produced Natural Scientists of Behavior

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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 (both of which Peachpit Press, in Berkeley, CA, USA, publishes). 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*.

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 less 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 authors, or the publisher, ABCs (e.g., at ledoux@canton.edu). 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 (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. ☺



Photo courtesy of ISU, Normal

The Author at
Illinois State University

FOREWORD

Personal Stories: Scientists' Narratives and a Science of Narrative

Thomas S. Critchfield*

Illinois State University, Normal

What follows is a rambling reflection on other people's personal reflections. It is an ironic reflection, because while discussing what storytellers do to make their stories enjoyable, I will tell one that strays into stodgy academic territory, to possibly less-than-enjoyable effect. In hindsight, I ought probably to have respected the maxim that some things (like the personal stories in this volume?) should be appreciated without deep examination—as per the old saw that *analyzing humor is like dissecting a frog: Few people are interested and the frog dies of it.*¹ But I have faith. Metaphorical frogs are tougher than given credit for. And surely the present volume's authors, as behavior scientists, will appreciate the use of their stories to set the occasion for questions about behavior.

Regarding my own personal story, here is all I will relate: I spent much of my fifth-grade year not studying, not hanging out with friends, not even contemplating the emerging mystery of fifth-grade girls, but rather poring over biographies of famous baseball players. For some reason I was especially obsessed with *The Harmon Killebrew Story* (Butler, 1965); more on this shortly. What's remarkable about my fifth-grade interest in other people's stories is how

* **Author's note:** I dedicate these comments to Larry Fraley, Ernie Vargas, and Julie Vargas, who, despite my best efforts to diddle away the first years of graduate school, taught me fundamental concepts and a style of logical analysis that made possible an enjoyable career. Without them, I wouldn't have much of a story to tell.

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¹According to the Quote Investigator website (<https://quoteinvestigator.com/2014/10/14/frog/>), this quip traces to E. B. and K. S. White's essay, "The Preaching Humorist," in *The Saturday Review of Literature* (October 18, 1941). However, I was unable to find the original to verify wording or provenance.

unremarkable it is. High on the list of things that make humans different from other animals is how often they tell stories about themselves and other people, and how often they listen (in the modality-independent sense described by Skinner, 1957) when others do the telling (e.g., Grant, 2005a, 2005b, 2007; Himeline, 2018; see also Bietti et al., 2009; Hsu, 2008; Mellmann, 2012; Polletta et al., 2011).

Informatively, storytelling and storylistening are intertwined. For instance, as this essay was being prepared I met a friend at a local watering hole, and he somehow managed to shoehorn, into the time required to quaff two beers, 14 personal stories (I counted) concerning his days doing applied behavior analysis (ABA) in 1970s developmental centers. This was possible because I, the audience, lapped up those stories as eagerly as I did the beer. Now, outside of the realm of mental illness, people usually don't tell their stories unless someone is listening. To expand on this point and also extend it to a more scholarly plane, note that an estimated 21% of published historical books are biographical (Kahn & Onion, 2016), yielding in the ballpark of 11,000 new biographies per year (Statistica Research Department, 2014). That someone is *buying* these books shows that listening is active behavior which comes at an opportunity cost. You cannot spend the same funds on both *The Harmon Killebrew Story* and candy; nor can you simultaneously read that book and chase fifth-grade girls. Listening to personal stories is such a robust repertoire that people are willing to forego other reinforcers in order to engage in it.

The present volume collects experienced scholars' personal stories, and these are likely to find an enthusiastic audience. Such enthusiasm, as a behavioral phenomenon, is as fascinating as the stories themselves. Why *do* listeners deem personal stories so valuable? This is no idle question, because if the science that Skinner (e.g., 1953) initiated is truly relevant to *all* human behavior, then logic suggests that the more prevalent a class of behavior in everyday life the more it begs to be understood. Regarding storytelling, it has been said that:

Talk about stories is everywhere. Between 1970 and 1990, 587 articles on narrative or storytelling were published in the journals indexed by Sociological Abstracts. In the next 20 years, 10 times that many were published. Interest in narrative has swept fields as diverse as law, urban planning, cognitive science, anthropology, and organizational behavior. Interest in narrative has burgeoned outside academia, too. Reporters have rallied around a movement for narrative journalism, and psychologists around one for narrative therapy. There are degree-granting programs in narrative mediation for lawyers and in narrative medicine for physicians. Political consultants promise to create election-winning narratives for their candidates, and business consultants promote storytelling as a management strategy (Polletta et al., 2011, p. 109).

Clearly, there is something here to explain.

On the Functional Significance of Personal Stories

One obvious benefit of consuming another person's story, as I'm sure readers are already aware, is to learn vicariously from it (a complex behavioral phenomenon; see Barnes–Holmes & Barnes–Holmes, 2002). If Harmon Killebrew became an accomplished ballplayer, then of course a ten year old with professional–baseball aspirations wants to know how he did it. Fifth–grade me therefore attended minutely to details of Young Harmon's life (like how he built strength lugging heavy milk pails around the farm) that seemed to set the stage for professional success. Also of interest might be *life* success: Killebrew was a quiet, pleasant, well liked man. My current acquaintances might say that fifth–grade me should have paid more attention to how *that* developed.

In case my turbid text later on costs me *your* attention, let me quickly record some of the things in this book that are worth emulating. Notice the writers identifying and chasing their own reinforcers, personal and professional, rather than following society's prescriptions for how a life or a career "should" unfold. Watch them embody Skinner's (1956) "Case History" admonition that "when something interesting comes along, drop everything else" (p. 223) and pursue it. See each writer accumulate apparently disconnected pockets of expertise, thereby exemplifying Pasteur's dictum that "luck favors the prepared mind" (in other words, the more different things you know, the more likely one of them will prove relevant to some new problem). Most especially, behold each life trajectory as a "drunkard's walk" (Mlodinow, 2009) whose delightfully nonlinear path makes sense holistically in hindsight but is hard to parse in terms of momentary cause–effect and most definitely diverges from what the writer might have imagined or planned when young. Life is a tapestry of behavior, not a single thread (King, 1971).

So by all means enjoy this volume's clues to constructing happiness and productivity... although that is not my primary focus in this essay. I wish to take up a more general matter that was telegraphed in my opening paragraphs. No biography has the potential to influence or instruct unless someone pays attention to it, so we must view the present volume's authors, not just as veteran scholars who have led interesting lives, but also as storytellers. If the point of reading others' stories is to learn life lessons, then here is one worth learning: Facts live their most vibrant lives as components of a good story. My favorite example of this "story power" concerns evidence–based, behavioral treatments for autism, the objective facts of which are spelled out in many peer–reviewed scientific articles, particularly Lovaas' (1987) report of a randomized controlled trial that yielded historically successful results. But what did the most to popularize ABA was not science but Catherine Maurice's (1993) alternately heartbreaking and inspirational chronicle of a family desperately seeking help for an autistic family member and finally stumbling by accident upon ABA.

Maurice's book contains no graphs or statistics, but it makes one person's story about ABA's effectiveness matter to others. Something in how Maurice crafted her story made parents not only read it but also demand ABA for their own children, and this, more than anything, accounts for ABA becoming today's preferred mode of treatment for autism. We should therefore take note, not

just of the facts of a story, but also the skillful wordplay that was employed in telling it. I can attest, as a grader of thousands of student papers over many years, that narrative skill is pretty rare, so anyone can benefit from learning how to inform others in an engaging, enjoyable way.

Narrative skill may especially benefit behaviorist listeners who, as a group, are notoriously poor communicators when interacting with nonbehaviorists. Our verbal community's communication practices have been regarded at best as unengaging or uninformative (e.g., Critchfield, 2022; Detrich, 2018, Foxx, 1996; Jarmolowicz et al., 2008) and at worst as tenebrous: "abrasive" (Lindsley, 1991, p. 449), "harsh" (Maurice, 1993, p. 102), and generally unpleasant (Bailey, 1991; Berger, 1973). This problem has existed for a very long time, as two examples illustrate. First, in the famous debate between B. F. Skinner and Carl Rogers (Rogers & Skinner, 1956), Skinner crafted an argument that is linguistically and philosophically precise but thereby also rather cold and distant in tone; whereas Rogers spoke warmly to the human concerns of his audience. Rogers' comments are measurably more pleasant (Critchfield, Becirevic, & Reed, 2017) and therefore the more effective sales pitch. Second, early practitioners of ABA chose to call their enterprise *behavior modification* and to explain it in terms of precise laboratory-derived concepts like *behavior control* and *conditioning*. They were then taken aback by a public perception that their work was coercive and unethical (e.g., Turkat & Feuerstein, 1979; Woolfolk et al., 1979). Unsurprisingly given such communication struggles, behaviorists often bemoan society's ignorance and rejection of their science. In case the underlying incongruity is not obvious, Detrich (2018) spelled it out:

We built a better mousetrap but the world did not beat a path to our door. It is somewhat ironic that what is arguably a science of influence (behavior analysis) has not been more effective at influencing the adoption rate of a science of influence (p. 541).

Often we imagine a personal story to be the product (dependent variable) of a person's accumulated life events (independent variable). But stories are also a social-verbal tool, that is, an independent variable with the potential to change the dependent variable of others' behavior (e.g., Detrich, 2018; Grant, 2005a, 2005b, 2007; Grant & Forrest, 2020; Hinline, 2018, 2022; Luntz, 2007; Rogers, 2003). Good storytellers are masters at manipulating the variables that control listener behavior, one aspect of which is my interest below.

The Narrative Dynamics of Story Enjoyment

The Particulars Fallacy

To repeat a point, before a story can change behavior, it must first hold attention. Although B. F. Skinner (1976) chose the most behavioral of titles (*Particulars of My Life*) for the first volume of his autobiography, that book is more than a dispassionate listing of "particulars." Such a story would be deadly dull, as the following example illustrates:

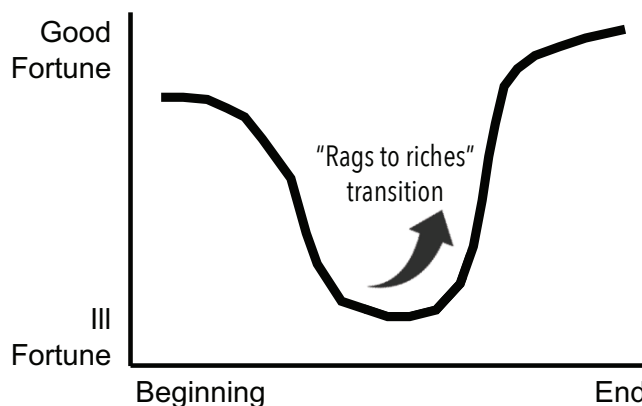
I preheated my oven to 400°F and set the oven rack in lowest position. I greased the interior of a 48-ounce ramekin with

softened butter, and added some grated Parmigiano-Reggiano, rotating the ramekin all around so cheese stuck to every part of buttered surface, and then wiped the soufflé dish rim before transferring the prepared ramekin to the refrigerator until ready to use. Next, in a small saucepan, I melted 3 tablespoons butter over medium-high heat, making sure not to allow it to brown. I added flour and whisked to form a paste, continuing to cook, stirring, until the raw flour scent was gone.... (adapted from Gritzer, 2020, unpaginated).

Did you find this interesting? For many readers, probably not (yawn). The fact that certain events happened does not guarantee an engaging story, just as for verbal behavior generally its emission assures no control over others' behavior (Skinner, 1957). Hence a lot of verbal behavior is (justifiably) ignored. Now, in contrast to the example in that block quote, consider one of my favorite authors, Mark Kurlansky, who specializes in esoteric nonfiction topics that you'd think would lack broad interest. But his books, including *Cod* (1997) and *Salt* (2002)—yes, that's really what they are about—illustrate that any story, on any topic, can spellbind when handled with aplomb. A narrator's challenge, then, is to construct a story so that its particulars will be interesting, even compelling, and available evidence suggests there are at least two components to this.

Diagetic Story Arcs

Diagesis means “plot,” in the sense of the flow of events in a story. The novelist Kurt Vonnegut (2005; unpaginated) imagined that we could understand plot dynamics by reducing them to a single quantitative curve, plotted (pun intended) on an axis ranging from protagonist ill fortune (“death and terrible poverty, sickness”) to protagonist good fortune (“great prosperity, wonderful health”). Figure 1 reproduces one of Vonnegut's curves, which he called “story shapes” and others have called story arcs (e.g., Reagan et al., 2016).



**Figure 1: One of many possible story arcs.
Redrawn from Vonnegut (2005).**

In Vonnegut's view, no single point on the plot curve defines a story; rather, listener interest depends on *fluctuations* in this curve. Listeners dislike a shift from good to ill fortune; this evokes consternation and unease. Listeners like a shift from ill to good fortune; such a “rags to riches” transition yields joy and relief (terminological note: Vonnegut applied the “rags to riches” label to one specific story arc incorporating an ill-to-good-fortune shift; here I take the liberty of using it for any such shift appearing within any story arc).

According to Vonnegut (2005), a good story needs both kinds of transitions, a point he highlighted rather hilariously by synopsising an “atransitional” story from Kafka:

A young man is rather unattractive and not very personable. He has disagreeable relatives and has had a lot of jobs with no chance of promotion. He doesn't get paid enough to take his girl dancing or to go to the beer hall to have a beer with a friend. One morning he wakes up, it's time to go to work again, and he has turned into a cockroach (unpaginated).

That is a story of nothing but ill fortune. Critchfield (2018) compared an atransitional story involving only good fortune to the children's television series Teletubbies®, one typical episode of which has been summarized as:

The Teletubbies make raspberry noises before watching a little boy called Connor with his grandfather's pigeons. (Episode 350 summary retrieved from https://en.wikipedia.org/wiki/List_of_Teletubbies_episodes_and_videos)

Overall, Vonnegut's (2005) central thesis is that good stories have both highs and lows, strategically interspersed. Stories lacking the proper arc fluctuations are a bore.

Regarding the importance of transitions, behavior scientists have speculated along similar lines as Vonnegut. Hineline (2018), for instance, described narrative fluctuations as the manipulation of motivating operations such that Plot Development A makes discovering Plot Development B reinforcing. To Grant (2005a, 2005b, 2007), this manipulation incorporates a kind of vicarious behavioral momentum effect: Stories first establish a character's behavioral baseline (an “equilibrium” consisting of normal situations, behavior, and reinforcers), which some force or event then swoops in to disrupt. The listener who identifies in some way with the protagonist then finds it reinforcing to learn whether that character's behavior will resist change, or if not, somehow return to equilibrium. I have intentionally oversimplified these nuanced scholarly accounts, but their similarity to Vonnegut's story shapes, and to each other, should be obvious. Hereafter I will refer to them collectively as the Hineline–Grant framework.

To date, the Hineline–Grant framework has not generated a means of quantifying motivating operations or shifts in “equilibrium,” so testing it empirically remains elusive. Nevertheless, the framework suggests a promising way to look at (and construct) personal stories. Take *Let Me Hear Your Voice* as a case in point. I do not have a child with autism, but Maurice's (1993) story harnesses every parent's deep concern for the well being of their children. Therefore, every time the writer finds a “miracle cure” I feel her momentary

elation. Each time a “miracle” is revealed as smoke and mirrors (mere quackery), I feel her creeping despondency. And most especially, this rollercoaster of highs and lows primes me, once Maurice finally discovers the genuine effectiveness of ABA, to celebrate along with her. The big picture here sounds very much like Vonnegut’s fluctuations in protagonist fortune, in which each new development indeed leaves the reader hungry to find out what happens next.

Emotional Story Arcs

Diagetic story arcs are a matter of story substance, but in story-telling style is just as critical. To illustrate, let’s examine some micro-level “stories”—really just simple phrases. The Republican Party strategist Frank Luntz (2006, 2007) was a master at telling the same story in different words, to vastly different effect. Figure 2 shows two issues, *undocumented workers* and *drilling for oil*, that long have been central to the Republican Party platform. The key words in these phrases are plotted against an empirical scale ranging from very pleasant to very unpleasant, which describes the visceral or gut-level reactions people have to their component words (data from the Warriner et al. [2013] corpus of norms for English words). Inconveniently for Republicans, *undocumented workers* (which they oppose) evoke a mildly positive response, whereas *drilling for oil* (which they favor) evokes a strongly negative response. Luntz (2006)

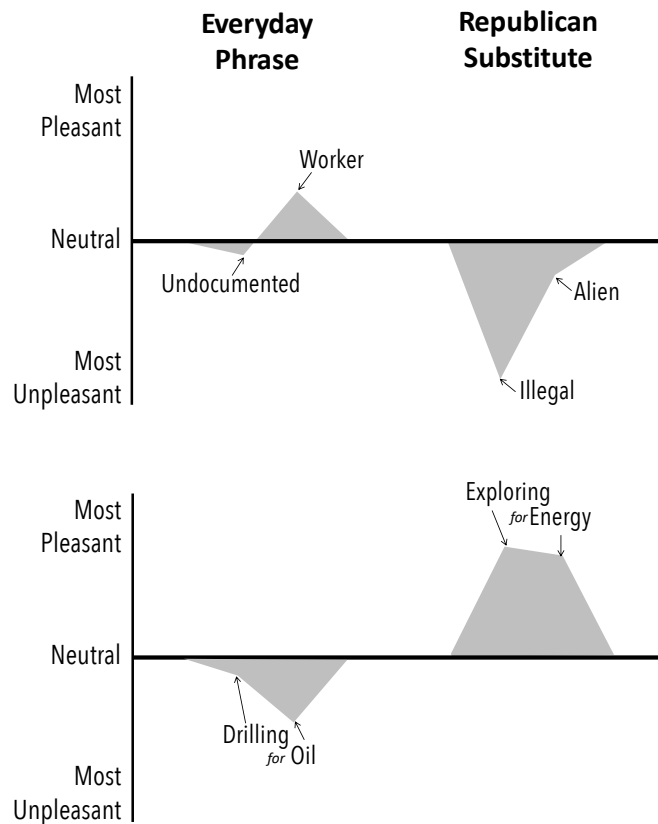


Figure 2: Two ways of saying the same thing, with very different word-emotion effects.

suggested that candidates use substitute terms that nominally convey the same thing but work to better effect for the party. Note in Figure 2 that, consistent with the aims of the party, people find *illegal aliens* unpleasant, and *exploring for energy* to be pleasant. That's perfect electoral propaganda, and Luntz's vocabulary helped Republicans, during the 1990s and early 2000s, persuade voters to embrace a platform that previously had left them a minority party.

For economy of expression, let us call the visceral responses that Luntz (2006, 2007) manipulated with his substitute vocabulary *word emotion* (even though the listener, not the word, emits the response). Lest some behaviorists in my audience have a conniption over this appeal to emotion rather than overt listener behavior, note that the underlying insight is not mine but Skinner's (1957): "The listener can be said to understand a speaker if he simply behaves in an appropriate fashion. The behavior may be a conditioned emotional response" (p. 277). Skinner (1945, 1953) also described emotional responding as a key component of the motivating operations that underpin the Himeline-Grant framework for understanding narrative (for more on this point see Critchfield, 2018).

Which words evoke what kind of word emotion isn't always intuitive (e.g., Critchfield et al., 2017; Foxx, 1994; Luntz, 2007), but skilled communicators are better than most at choosing their "emotion words." All things being equal, it is expected that listeners will prefer pleasant words to unpleasant ones (Boucher & Osgood, 1969), so skilled communicators employ pleasant words where possible. Yet there is more to word emotion than compiling pleasantries. Research suggests that listeners particularly like it when verbal behavior pivots from unpleasant to pleasant word emotion. In one study (Strick & Volbeda, 2018), two-sentence micro stories were constructed, examples of which appear in Figure 3. Because the overall emotional impact of a multi-word sample of verbal behavior depends on its most strongly emotional words (e.g., Dodds & Danforth, 2009), Figure 3 represents the micro stories in terms of their words (boldface) that fall at least one standard deviation above or below the word-emotion mean for English overall (based on Warriner et al., 2013). For the top story (in Vonnegut-ese, a case of "rags to riches"), the first part was unpleasant and the second pleasant. Stories like this were liked and functioned as reinforcers (specifically, stimuli paired with them became conditioned reinforcers). For the bottom story ("riches to rags"), the first part was pleasant and the second unpleasant. Stories like this were disliked and functioned as punishers.

This same effect may be evident on a larger scale in the findings of a research project that mapped a sort of running mean of word emotion across the length of many popular books (Reagan et al., 2016). Using a format reminiscent of Vonnegut's, Figure 4 shows empirical story arcs from three autobiographies (panels adapted from <http://www.hedonometer.org/books/v1/>). The ordinate is mean word emotion, on a scale ranging from 1 = unpleasant to 9 = pleasant. As the running mean of word emotion fluctuates across narrative time, note that there are points that reproduce the "rags to riches" shift mentioned earlier: the emotional arc dips below the book's overall mean pleasantness level (arrow), then bounces back into more

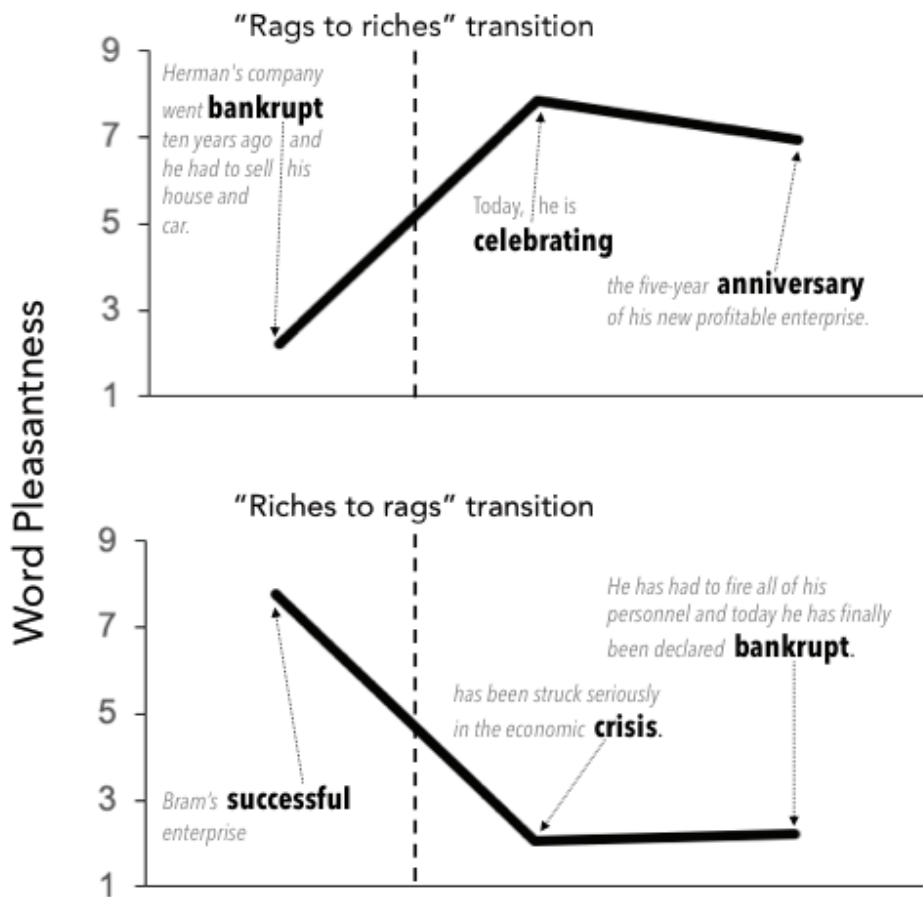


Figure 3: Story arcs for two micro stories.

pleasant territory. These transitional moments may be essential to, or even define, a compelling story (e.g., Critchfield, 2018). Note that these curves are based strictly on word emotion (visceral responses to the individual words), with no explicit consideration of story “content.” However, it seems logical that speakers will favor pleasant words for describing pleasant events and unpleasant words for describing unpleasant events. Thus, story arcs based on word emotion and on plot points probably overlap considerably.

Concluding Thoughts

Common sense suggests that constructing a good story *must* require more than simply peppering it with “rags to riches” moments; otherwise good storytellers would be common. I presented story arcs here merely as a way of illustrating that stories are potentially understandable in terms of behavior: what storytellers do and how this affects listeners. Now that we have explored some ideas about how story arcs grab and hold attention (and possibly persuade

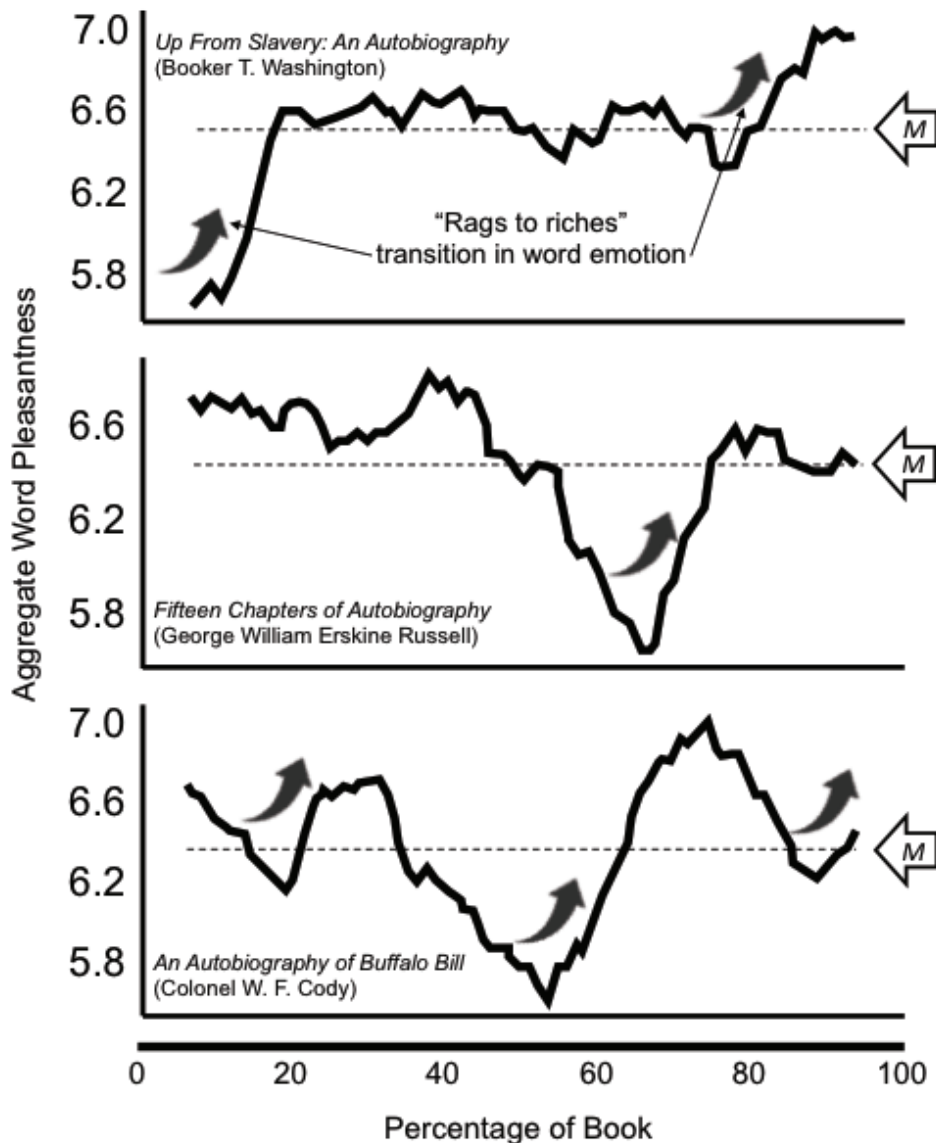


Figure 4: Empirical narrative arcs of three autobiographies.

or motivate), where does this leave us? I hope that, for academically inclined readers, I have sensitized you to some prospects for what Grant (2007) called behavioral narratology, or the formal study of what speakers do when they tell stories and listeners do when they consume them. This is some of the most interesting behavior on the planet and no science of behavior can be complete without studying it. And yet behavioral researchers are only beginning to scratch the surface of how stories work. It's revealing that the terms *narrative* and *story* do not even appear in the index of Skinner's (1957) seminal analysis of verbal behavior. Given this prominent historical precedent, it is unsurprising

that there exist no systematic research programs on narrative as the behaviorist conceives of it. And the few existing efforts at story-targeted behavior *theory* development have so far landed with a quiet thud. Table 1 lists some relevant articles and shows the attention they have received (based on October 13, 2002, searches) in terms of scholarly impact (citation count accessed via Google Scholar) and dissemination impact (Altmetric Attention Score, accessed via the Altmetric Explorer app). The latter is an aggregate of several types of non-scholarly or popular culture mentions, with higher scores indicating more mentions (for more on Attention Scores, see Critchfield & Dixon, 2022; for more on dissemination impact, see Critchfield et al., 2022). Although the papers listed in Table 1 are full of promising theoretical proposals, hints at how to build research programs, and suggestions for how to use narrative effectively, most have been all but ignored. Their impact pales by comparison, for instance, to that of Baer et al.’s (1968) seminal description of ABA (6247 citation and an Altmetric Attention Score of 73); or Thompson’s (2010) treatise on climate change and behavior (158 citation and an Altmetric Attention Score of 181). It should be clear that there is plenty of room, and a desperate need, for new programs of investigation that will help us to better understand both the telling and listening aspects of personal stories.

For those with practical rather than scholarly predilections, by all means enjoy this volume’s deftly presented accounts of particulars, and by all means examine them for clues about shaping your own life and career. But also carefully inspect them as examples of how people “do” storytelling. Notice the largely upbeat tone of the stories, which suggests an effort by authors to employ pleasant words when possible. Take note of where the stories grab and lose your attention, and of what writers did with their words and “plot points” when this happened. Even more to the point, notice where the stories move or inspire you, and examine how *this* was accomplished. Where the stories really succeed, I suspect you will find examples of the story arcs described here and, in the absence of evidence-based, best-communication practices, such

Table 1: Limited impacts of some behavioristic accounts of story telling.

Article	Scholarly Impact (Citations)	Dissemination Impact (Altmetric Attention Score)
Hineline (2018)	32	0
Barnes-Holmes & Barnes-Holmes (2002)	17	0
Barnes-Holmes et al. (2018)	14	0
Grant (2005a)	13	0
Detrich (2018)	9	0
Critchfield (2018)	7	2
Snyckerski et al. (2018)	7	0
Grant (2007)	5	0
Palmer (2018)	2	4
Grant & Forrest (2020)	2	0
Grant (2005b)	0	3

models become exceedingly valuable. After all, even if behavior science hasn't yet matured to the point where it can offer practical advice about narrative, lives and careers still require each of us to inform and entertain and motivate others. Stories are a widely recognized tool for doing this, and thus your own ability to tell a good story will help to dictate how *your* story turns out. If this volume helps in any way, you can be grateful that the authors went to the trouble of telling theirs.✿

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Reader's Notes

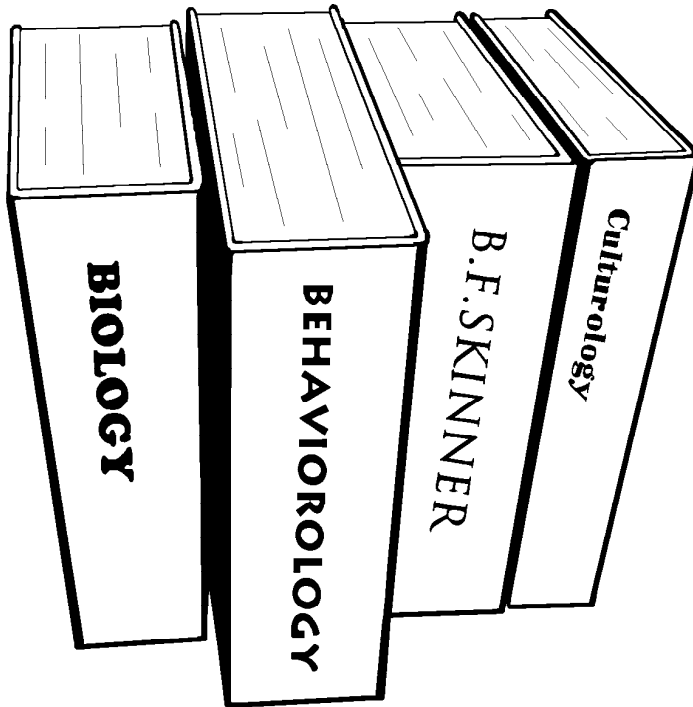
Less–Traveled Roads— Circumstances that Produced Natural Scientists of Behavior

*Several natural scientists of behavior
provide autobiographical accounts of
what caused their participation in
science & its beneficial applications.♣*

Edited by Stephen F. Ledoux

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Behaviorology in its Immediate Scientific Neighborhood

***Introduction* [previously the Preface]**

Stephen F. Ledoux*

*F*or several years now, contingencies of many kinds have gradually contributed various reasons for planning for a book, or series of volumes, each about 200 pages, wherein different natural–scientist–of–behavior authors tell their life stories. These are the stories of the circumstances (i.e., the contingencies, the relations between the independent–variable “causes” and the behavior dependent–variable effects) that led to, or contributed to the conditioning of their natural–science repertoires along with the various outcomes and products of those contingencies and repertoires over their lifetime. These stories tell us what led to, or contributed to, their being productive natural scientists of behavior.

Then, in February 2021, someone reminded me that a somewhat similar recent book was out of development and now available. This book was the *Omnibus Edition of Behavioral Science: Tales of Inspiration, Discovery, and Service*. It was published by the Cambridge Center for Behavioral Studies (CCBS) in 2017 (visit www.behavior.org). My copy arrived later that February.

At first, that book looked like it might be the kind of planned contingency–oriented book mentioned above. As an enjoyable and informative read, it indeed tells valuable “tales of inspiration, discovery, and service.” It focuses on the stories of many capable people in the history of the field of behavior analysis while letting some information—sometimes contradictory, which is not a problem but indeed a predictable outcome of the sometimes contradictory contingencies people were operating under—leak out through the stories about various connections between this field and the traditional discipline of psychology.

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 rather different book from the kind of book envisioned here, the book you are holding.

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, engineering, experimental, applied and philosophical components, is separate from any discipline sporting magical, mysterious, or spontaneous causal accounts for behavior, either theological or secular (e.g., agential causes). This independent status holds regardless of what kind of history various

*Full descriptions of this and subsequent volumes appear on the BOOKS page of www.behaviorology.org (which does *not* sell books). Short descriptions of this and subsequent volumes appear on www.lulu.com (which *does* sell books) where these books are available on green “Print–On–Demand” status (click the magnifying glass and enter my name). Address correspondence regarding this book to the publisher (at ledoux@canton.edu or at www.BehaviorInfo.com).

natural scientists of behavior have had with these disciplines (e.g., starting out in them and/or being employed in their work units). 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 that 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 that appears to various extents in these stories, writing that perhaps succeeds in showing that the telling of such stories can occur without relying on the presumptuous and misleading agentially 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 “I” “do” here—in its verbal-shortcut sense (i.e., to stand in for more lengthy, technically accurate phrases like “DNA-based carbon-unit locus of contingency effects”). And readers familiar with the natural science of behavior share that understanding. But that group comprises a rather small portion of all potentially interested readers.

The book you are holding tries to avoid that agential trap by design, at least through its examples of auto-biographical stories that resist the first person “I,” because of its agential connotations that traditional cultural conditioning spreads widely and deeply, 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, this book’s questions for authors to answer are these: “What caused your becoming a natural scientist of behavior? What were your activities and products as a natural scientist of behavior? And what caused those activities and applications and products?”

As that phrasing shows, these autobiographical chapters use some new techniques of grammar that help shift away from the agential perspective. Thus these stories can, by their example, show the serious value of this science to society. They might even inspire those who find out about this science and its scientists and practitioners, especially perhaps young people, who might become interested in the science, and might even pursue it.

For this book and any future volumes, authors have no writing deadline. Instead, as manuscripts arrive, each book will be complete when it reaches about 200 pages (because that size, even allowing for the inclusion of full-color photos, might not cost more than \$20, which makes cost less burdensome to potential buyers). Generally, the sequence of manuscript arrivals determines the sequence of the biographical stories. As more manuscripts arrive and accumulate to about another 200 pages, they will become another volume, and so on. And, with multiple authors, no one makes money on sales of these books because, after covering costs, any income from sales, perhaps only a dollar or two per copy sold, go to science-supporting organizations, starting with the B. F. Skinner Foundation (www.bfskinner.org) for this first book.

Here are the titles and authors of the chapters in this book:

✂ ***In Search of Scientific Accuracy—A Short Autobiography***
Stephen Ledoux

✂ ***An Unconventional Path to Behavioral Naturalism***
Michael Shuler

✂ ***Getting To Be A Behaviorologist***
Lawrence Fraley

✂ ***A Self Portrait Painted in Words***
Zuïlma Gabriela Sigurðardóttir

✂ ***Have Passion, Will Travel: Adventures in Data, Behaviorism, and Life***
Michael Clayton

Book Origins

The various contingency-produced reasons for planning a book like this included originally covert responses like these: Perhaps some day a bunch of us natural scientists of behavior (e.g., behaviorologists) can put together a book wherein each one 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. This would avoid writing what sounds like a popular computer-brand commercial (e.g., I..., I..., I...) while also (a) preserving some of the history of the natural science of behavior, (b) describing some of the successful range and extent of the various contingencies that condition currently rare behaviorology repertoires and products, (c) showing, 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) showing that contingency-analyzing autobiographies can be more accurate, meaningful, even scientifically valuable, than the claims of various agential causalities.

The book plan for these relatively short “auto bios” also does not *focus* only on “how I came to behavior analysis/behaviorology.” Its focus is broader as in “what contingencies, actual or coincidental, were operating that led the authors in the different directions that lives typically take.” Of course, somewhere that would, and should, include “how ‘I’ came to behaviorology/behavior analysis.”

Perhaps contact with such a book would 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 those 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 of most authors. And books like this are part of such contingencies. The point is to show, by actual examples, that “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 pronoun usage. Ahhh; perchance to dream.

Traditional autobiographies almost forgivably over use “I,” along with “me,” “my,” and “mine,” although these carry far less of the agential weight than “I” carries. So autobiographical authors here need not worry much about these pronouns. And if books like the one under discussion was *just* for people already familiar with the science, then the avoid-pronoun effort would be unnecessary. That is, if the books were just for those already conditioned through various science resources to respond only to the verbal-shortcut meaning of “I” rather than to its agential connotations, then the effort would be less needed. One way such conditioning happens is by the conditioned effects wrought by design in the writing and reading of books like my 2014 book, *Running Out of Time...*

But books like this one are *not* just for us. This book could have a far greater value, than just the value of the life stories 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 multiple examples, from a range of authors, that show that telling their stories can happen without relying heavily on “I” (or even on passive voice, although that is one way to avoid “I”) while instead making other nouns (and not necessarily always “contingencies,” although that would be OK) the subject in sentences. And that 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 these books help 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 divisive agential realities of both the theological and secular type.

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

Also, the writing style where “one can speak of oneself as ‘I’ and still point out the contingencies that shaped one’s repertoire,” is certainly possible, but the more valuable exemplar for others would then be unavailable. It would be missing for those whose traditional cultural conditioning still makes them see the “no ‘I’” style as repetitive, and possibly contradictory, because, as they might say, “the ‘I’ is already the cause, so you don’t really need to discuss contingencies...”

For that reason we start with efforts like books of autobiographies written with less agentialism. Someday society will take behaviorological science for granted, relegating agentialism (some say “agentism”) to the realm of past historically resolved problems. Then, that style (i.e., “one can speak of oneself as ‘I’ and still point out the 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, or to those in literature and history in particular.

A Little More About a New Grammar

Perhaps a few paragraphs can give readers some additional hints about the reasons for the sometimes uncommon grammatical constructions and usages in these autobiographical stories. They begin as an exercise in scientifically accurate writing about someone's life. This "scientific accuracy" refers to avoiding the misleading chatter or implications about life's directions and products coming about because of inner behavior-causing agents, even those implied by personal pronouns such as "I," that often pervade traditional biographical efforts ("auto" or not). Using "I" misleads many readers regarding the actual reasons that produced the directions and products of a life. (While not without problems, pronouns like "me," or "my," or "mine" seem easier to manage.)

That effort for scientific accuracy does *not* occur for fun. Rather it occurs to support efforts to make a better world. And it carries certain risks in that, while it helps all readers in the long run, it bugs some readers in the short run. The education of behavior-science professionals conditions them to respond to personal pronouns as mere verbal shortcuts that replace all the words that traditional grammar requires to avoid or overcome the agential implications of personal pronouns. For example, after educational, science conditioning, "I" or "me" or "my" or "mine" no longer evoke false-notion responses of any of these naming a causal agent inside a body. Instead, each of these now evokes the accurate response of their being a verbal shortcut that replaces longer and more cumbersome but technically accurate phrases such as the phrase we used earlier, "DNA-based carbon-unit locus of contingency effects." Would you—another verbal-shortcut personal pronoun—prefer repeatedly reading such phrases, or some equivalent, or would you prefer reading an occasional verbal-shortcut personal pronoun?

But a couple of paragraphs of partial conditioning on this matter—like those just covered—usually prove somewhat insufficient for lasting effects, which is why herein we (yes, another verbal-shortcut personal pronoun) prefer to avoid the use of personal pronouns, especially "I." (Presumably, educational experiences have already conditioned most reader's understanding of the phrases "DNA-based" and "carbon unit." To more easily grasp "locus of contingency effects," read Ledoux, 2014 or 2017.)

Without the educational conditioning, however, many people easily respond as if the implied inner agents are somehow real, even respectable. Since scientifically the inner agents are neither real nor respectable, authors in these books work to enhance accuracy by writing with other than personal kinds of sentence subjects. To be honest, this really means some new "grammar." Why make this 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 a natural science of behavior.

And 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.)

In support of scientific accuracy, the autobiographies herein set aside the notion of agential causality. Then, perhaps in the "third person," they 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 an author's life. These "contingencies" are the dependencies, the relationships, between behaviors and their "causes," their independent variables, that thus scientifically account for the directions, products, and behaviors 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.)

Some Disclosures

Respecting full disclosure, some parameters can clarify for readers how some things get done in this and subsequent volumes: Authors retain control over the rights to publish their chapters elsewhere. And the audience for this book is the general readership of the culture and "for the record."

Regarding citations and references to other sources, some authors follow a standard pattern of citations (in the text, as "author, year") with references at the chapter end. Others integrate references directly into their texts.

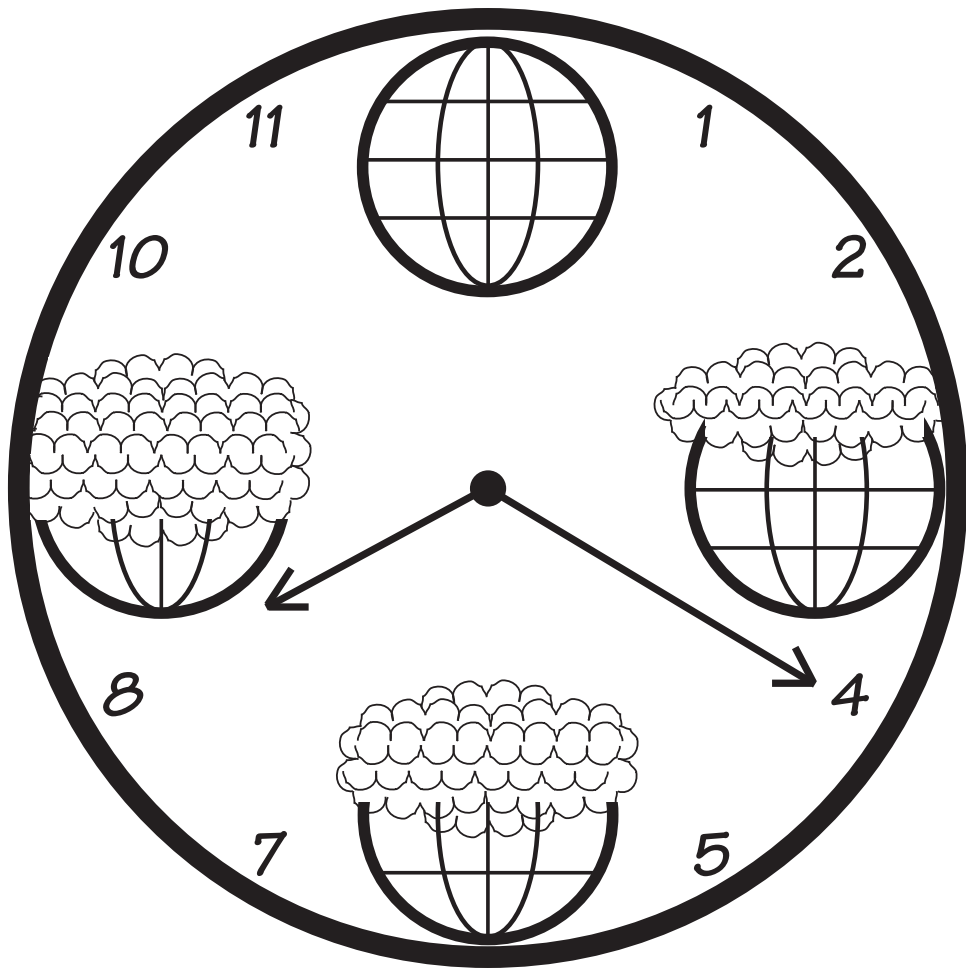
Wherever possible, however, footnotes get limited to the opening page of a chapter. These books follows this policy, because footnotes—at chapter ends or at the back of the book—often drive readers crazy.

Authors might also need to touch on various principles or practices of behaviorological science about which some readers could be unfamiliar. In such cases authors provide readers with brief summaries of those principles or practices, supported with citations and references to available, appropriately leveled materials. See the BOOKS page at www.behaviorology.org where books that "introduce" behaviorology range from a doctoral-level book (Fraley, 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 and 2021b).✿

References (with some annotations)

These books and many others all have full descriptions on the BOOKS page at www.behaviorology.org and most of them are now available through green “Print–On–Demand” at www.lulu.com (click the magnifying glass and enter the author’s name).

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- Ledoux, S. F. (2017). *What Causes Human Behavior—Stars, Selves, or Contingencies?* Ottawa, Canada: BehaveTech Publishing (a 450–page general–audience primer).
- Ledoux, S. F. (2021a). *Explaining Mysteries of Living (Expanded)*. Los Alamos, NM: ABCs. This 480–page book features 72 newspaper columns on the basic principles, concepts, and practices of behaviorology. While these topics receive more comprehensive and technical coverage in the Ledoux 2014 and 2017 books, this *Explaining Mysteries of Living (Expanded)* book also includes six column–supporting papers and color graphics. An earlier edition lacking the color graphics remains available at www.lulu.com.
- Ledoux, S. F. (2021b). *Science Is Lovable—Volume 2 of Explaining Mysteries of Living (Expanded)*. Los Alamos, NM: ABCs. This 390–page book features 72 more newspaper columns that cover deeper topics in behaviorology including research and applied methodology, and some initial scientific answers to some of humanity’s ancient—and as yet inadequately answered—questions such as on values, rights, ethics, morals, language (i.e., verbal behavior), consciousness, personhood, life, death, reality, and even the more recent topics of robotics and evolutions. While these topics receive more comprehensive and technical coverage in the Ledoux 2014 and 2017 books, this *Science Is Lovable—Volume 2 of Explaining Mysteries of Living (Expanded)* book also includes three column–supporting papers and color graphics. An earlier edition lacking the color graphics and supporting papers remains available at www.lulu.com.📖



Running Out of Time

Stephen F. Ledoux (2013)