

The Future and Behaviorology

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This paper¹ looks briefly at the question of “the future of behaviorology” as a growing discipline. However, the emphasis is on “the future *and* behaviorology,” specifically, what behaviorology has to contribute to the future of humanity.

“Behaviorology” is the name that some natural scientists use for the natural science discipline (Ledoux, 2002a) focused on behavior. Others prefer the name “behavior analysis,” including not only those who are as yet unfamiliar with the reasons for using the term “behaviorology,” but especially those who are trying to mesh this natural science with traditional psychology. Under some circumstances—which this author and Lawrence Fraley discussed elsewhere (see our papers in Ledoux, 2002b, especially Fraley & Ledoux, 2002)—either name could serve. Regardless of the name, this discipline began in the 1930s when B.F. Skinner applied the natural science principles and concepts of biology, which he was studying at Harvard under the head of the physiology department, W.J. Crozier, to the question of what causes behavior. After determining experimentally how behavior works, Skinner and his students and colleagues and their students began addressing the related question of how to change socially significant behavior. The successful history of this behavior science is especially worth noting at this time, near 2004 March 20, as this is the 100th anniversary of Skinner’s birth.²

The growing pace at which natural scientists of behavior have been developing and advancing the concepts, principles, and applications of behaviorological science during the last 50 years portends a vigorous future for our discipline. However, cultural contingencies involving pre-scientific, mystical verbal behaviors continue to cause widespread resistance to the implications of this natural science discipline, implications pertaining to the status of humankind in nature, implications regarding Darwin’s finding of continuity across *all* species including *Homo Sapiens*, implications that *extend* that continuity *from* our biology and its causes *to* our behavior and its causes. These contingencies evoke a special resistance to any implication that divine will has not elevated humanity above other species. And these contingencies also evoke a special resistance to any science responsible for these implications. Long-standing cultural contingencies

make all such implications aversive to many members of society, prompting them to actions of commission and omission that retard the much needed impact of our science, and perhaps threaten the very survival of our discipline. As we work to ensure a bright future for our natural science of behavior, we should look closely at the effects of superstitious verbal behavior across society; we should engage in efforts that reduce society’s reliance on un-scientific verbal behavior; and we should endeavor to increase society’s thinking and speaking from a more naturalistic and valid perspective. Indeed, in the long run, the greatest contribution of behaviorology to humanity’s future may be in prompting a more consistently scientific verbal behavior, especially when considering questions of human behavior, particularly across the range of other natural sciences, and hopefully across the range of applied fields, as well as within the discourse of the general population.

Past to Present

To maintain perspective, one must remember that the past contributions of behaviorological science will likely continue to develop in the future. These include advances in the basic principles and concepts of behavior, made through the experimental analysis of behavior, along with improvements in the applications of those principles and concepts in diverse areas ranging from simple animal training to the challenging complexities of autism interventions. Our very success in these particular areas has, however, caused some problems.

While we bask in the media attention to these successes, we are less successful at assuring that the media inform the populace about our science and how it applies far more widely than these successes. Being ignorant of the particulars of our discipline, and experiencing the aversiveness of our science’s implications, society comes to see our relevance as basically limited to the behavior of non-human animals or autistic children. Are we purchasing our public acceptability with the currency of condoning false impressions that operant contingencies work only with laboratory or entertainment animals, or with severely developmentally disabled people? If we do that, we may be placing the development of further contributions at risk (and possibly risking the survival of our discipline as well). On the other hand, we reduce these risks, and make perhaps our most important contribution to the future, through our efforts to undo the aversiveness of our science’s implications by prompting a consistently scientific verbal repertoire, pertinent to all areas of the culture, regarding questions of human behavior.

Present to Future

At present we are beginning to see some valuable *additional* contributions develop, ones that we should avoid

placing at risk. We see some broadening of our successes in several areas. We see more successes in child rearing as more parents and caregivers, at home and in day care centers, learn to apply skills derived from the behavioral works of authors such as Glenn Latham who has written several books on positive parenting (e.g., see Latham, 1994, 1999; also see Ledoux, 2001). We see more successes in education, with respect to both instructional methods and classroom management, as teachers learn to apply skills derived from the behavioral works of authors such as Kent Johnson and Og Lindsley (e.g., see Johnson & Layng, 1991; also see Lindsley, 1992; Latham, 1998, 2002; Ledoux, 2000; and West & Hamerlynck, 1992). We see more successes in business and industry, through performance management, as workers and managers learn to apply skills derived from the behavioral works of authors such as Aubrey Daniels (e.g., see Daniels, 1989, 2000). And we see more successes—with the potential for a great many more—in the full range of areas across society, from interpersonal concerns to the concerns of governments and diplomacy, as both professionals and members of the general population deal with problems through the kinds of proactive, prevention oriented, non-coercive, behavioral practices that Murray Sidman advocated in his book *Coercion and Its Fallout* (Sidman, 2001; also, see Kopp, 2001).

Some behaviorologists and other behavioral scientists are also turning to areas that have received little scientific scrutiny. They are analyzing these areas not only for the variables currently operating in them, but also to consider how to change those variables to improve behavior in these areas. For example, Lawrence Fraley has gone beyond the question of how to help survivors deal with the impending death of a terminally ill loved one; in a book he is writing, *Behaviorological Thanatology* (also see Fraley, 1998), he explores the behavior-science-based options of those who are experiencing a terminal illness, and how society can help them maintain their dignity. Fraley has also considered the application of behaviorology to the question of penal corrections; in another book he is writing, *Behaviorological Rehabilitation* (also see Fraley, 1994), he investigates behavior-science-based options for improving human interactions and situational factors to build success rates in institutional rehabilitation settings such as prisons. And Ledoux, with his colleagues and students in China, has begun to extend the analysis of verbal behavior (Skinner, 1957; Peterson, 1978) to the language classroom. His current work in this area (Ledoux, Michael, & Miguel, 2002) centers on a one to three day workshop summarizing verbal behavior analysis and exploring some of its implications and applications for increasing the effectiveness and efficiency of foreign language instruction. (People who are interested in behavioral science and technology can access a

continually increasing number of behavioral resources regarding a wide range of behavior-related topics, including links to related web sites, by regularly visiting www.behaviorology.org which is the web site of The International Behaviorology Institute [TIBI].)

Benefits for humanity from those and other areas will continue to accrue. Indeed, as the research of behavioral scientists continues to expand our repertoire regarding the natural causes of behavior, people will eventually come to realize that behaviorology can have a beneficial impact in every area of human behavior. That is an easy promise because the implications of natural science are ultimately more efficient, effective, and humane, than are the implications of investments in superstition that they supercede.

Future

In spite of our successes, the history that our *natural science* discipline shared with the discipline of psychology often leads others to misconstrue our discipline by presuming we are still part of psychology. That is inaccurate; we are not part of psychology. Ours is a discipline of strictly naturalistic explanations of behavior. Traditional psychology, on the other hand, is a discipline of fundamentally mystical explanations of behavior (although some individual psychologists may personally be in disagreement with their discipline about this). Most psychologists ultimately rely on behavior originating spontaneously (i.e., non-naturally) through the ethereal, body-dwelling agents connoted by such terms as mind, psyche, or self. Behaviorology is logically not part of psychology because our reliance on strictly naturalistic explanations of behavior is incommensurable with the fundamentally mystical explanations of behavior retained in the psychology discipline. Could we not change psychology into a natural science? For over 50 years, a minority of natural scientists of behavior working in psychology tried in many ways to change psychology into a natural science discipline. The data from those 50 years of attempts to change psychology, which Fraley and Ledoux (2002) explored in detail, reveal that psychology would have continuously kept the natural science of behavior minimized, while the behavior analysts in psychology wore themselves out struggling unsuccessfully to change psychology into a natural science of behavior. (However, all this does not describe the full range of possible contingency outcomes everywhere. The contingencies in the geographical region of the reader may vary enough to lead to the psychology discipline in that region evolving into a natural science after ending allegiance to mystical assumptions. Many questions about the resulting natural science discipline would, though, still remain. Here are just a couple: (a) What would the relationship of the resulting discipline be to the rest of psychology, in

other regions, that still adheres to superstitious assumptions? And (b), since part of the disciplinary definition of psychology is adherence to mystical assumptions, then the resulting discipline would no longer be psychology, so by what name would it be known?)

Even though a natural science of behavior is separate from psychology, in the view of other natural scientists (e.g., physicists, chemists, biologists) our past association with psychology continues to compromise our position. The significance of our separation from psychology is lost in the confusion over the nature of behavior. When questions of behavior confront these other natural scientists, their answers are not scientific; psychology informs what they say because in their experience psychology has been the only game in town addressing behavior. Since our discipline is still quite young, it has not yet had the time to become included with other natural sciences in the education programs of these scientists and their followers and practitioners. Yet both their culture and their general education include the psychological perspective. Their verbal treatment of behavior is psychological; it is not yet informed by behaviorology. This is why we must work to prompt a consistently scientific verbal repertoire about behavior among other natural sciences and applied fields (which will also yield a more accurate treatment of behavior among the general population). Again, the greatest contribution of behaviorology may be in this prompting of a consistently scientific verbal behavior about behavior across society.

Here are just two examples, gleaned from across the wide range available, where behaviorology needs to be the discipline that informs colleagues in the general population, and in other sciences and applied fields, about behavior. Across society people too readily offer accounts of behavior that are not helpful, in part because more helpful accounts are not available. These unhelpful accounts then become harmful, for their presence reduces the likelihood that better accounts will be well-researched and applied. Consider this as we turn to the two examples. These examples are not special. They are common, even trivial, and that is their significance.

The first example pertains to how members of the *general population* can benefit in the future from a widely available discipline of behaviorology, a circumstance that would improve people's verbal behavior about behavior. The January 2004 issue of *Consumer Reports* contains an article on the importance of people reducing the amount of fat in their diet ("Cut the Fat" on pp. 12-16). The "CR Quick Take" sidebar on page 12 reads "No one is forcing you to overeat..." This quote exemplifies an account that psychology has informed with the psychologically allowed, even advocated, notion of free-will. If "force" (as coercion or punishment) is an example of the only kind of variable considered to exert control over behavior, with

the rest of behavior, such as the behaviors of eating and overeating, arising spontaneously from some body-managing agent inside the body, then we could take this statement at face value: No one *is* tying you down and force feeding you more than you need. Logically then, if you are overeating (perhaps indicated by your being overweight or experiencing other problems related to excess food intake) then the problem rests *with you*, and the solution is just to stop eating so much food. What could be easier? Some people may say that you need to show a little more backbone, in the face of food, to eat less. Or perhaps you need a little more will power, or a little more ego strength, or a little more capacity for cognitive processing. Or maybe you need your body altered by a little more medication, or a little more of the right brain chemicals, or a little more... well, unfortunately, this list could go on and on.

However, are the solutions really that simple? Are coercion and punishment really the only variables that can affect behavior? Are backbone, will power, ego strength, or cognitive processing relevant variables to the prediction and control of behavior? Are medications and altered brain chemicals, etc., fully feasible solutions to behavior problems? Will any of this conventional wisdom stand up to scientific scrutiny? Health problems from overeating are quite real, but are these largely superstitious approaches the best society can offer to solve such problems? And, most importantly, why are we even having to ask such questions?!

We are asking these questions because writers of these kinds of explanation, writers who are typical of society in general, have not learned any better explanations, have not learned any scientific explanations. But what if these writers had had their repertoire originally conditioned through exposure to behaviorological science in their educational history? What if they had avoided the heavy cultural indoctrination in superstition? What if they could offer their readers explanations of overeating, and solutions for overeating, in scientific terms? What if they at least knew enough to talk in terms of the effects of deprivation and stimulus control, and the ways to arrange such variables such that overeating became less likely (i.e., ways the would counteract all the independent variables causing you to overeat that food sellers, and others, use to increase overconsumption, and thus their profits, such as "supersizing" a meal at a bargain price compared to a smaller meal)? And what if their readers also had learned enough behaviorological science to be affected by what they read in ways that helped make overeating less likely? All of these will be more possible as our efforts to broaden the availability of our natural science of behavior become more successful. Multiply this across all areas of society where questions of behavior arise, and one can see why the future can gain so much from behaviorology.

My second example pertains to how *other natural scientists* can benefit in the future from a widely available science of behaviorology, a circumstance that would improve their verbal behavior about behavior. The March 2004 issue of *Sky and Telescope* contains a featured article that Dan Falk wrote to help non-physicists better understand the debate currently raging in astronomy/cosmology over the resurgence of what is called the “anthropic” principle (“The Anthropic Principle’s Surprising Resurgence” on pp. 42–47). In (perhaps overly) simplified terms, this principle says that we must surely have a special place in the universe since we could not exist, let alone ponder the question of the existence of the cosmos, in a universe that differed from this one in the value of some basic parameters that govern the physical world such as the strength of gravity and the masses of subatomic particles. For example, if gravity had been even a little stronger, then the universe should have collapsed in a “big crunch” long before life evolved, whereas if it had been a little weaker, then matter would not have coalesced into galaxies, stars, planets—and life.

The physical science community has members on both sides of this debate, although more seem opposed to it than in support of it. Falk reports that Andrei Linde, a supporter of the anthropic principle, goes so far as to speculate “on links between consciousness and the physical world” (p. 47). In part, such indulgence in superstitious talk results from natural scientists being informed through the mysticism of religion and psychology, and thus suffering from the same illogic that mystics exhibit with respect to naturalism. To be fair, some critics “view the anthropic principle as intellectual surrender” (David Spergel, p. 47). These critiques, however, tend to be limited to issues that the traditional natural sciences have already considered, such as how the anthropic principle “plays into the hands of ‘Intelligent Design’ supporters who feel the universe was custom-made for human beings by a benevolent God” (Dan Falk/David Gross, p. 46), an issue that biology has faced frequently and handled with some success. Since the critics of the anthropic principle are also informed through their recourse to psychology, when questions of behavior (including consciousness) arise, they are unable to apply the more effective critiques that would derive from a natural science of behavior (such as a natural science analysis of the nature of consciousness, and the kind of links that are then possible between consciousness and the rest of the physical world—see Skinner, 1953; also see Fraley, 2004).

What if the natural scientists on both sides of this debate were bringing to their debate a consistent educational background that included the full extension of their natural science approach to the questions about behavior that they inevitably face? That is, what if their verbal behavior about behavior were informed by the natural

science of behaviorology? Rather than becoming hopelessly trapped in solipsistic and sophistic mysticisms which they can debate forever (like the old, still unresolved—and unresolvable—question of how many angels can dance on the head of a pin), they might resolve their debate over the anthropic principle rather expeditiously. This is what virtually always happens: When a valid and appropriate natural science has been finally brought to bear upon such otherwise resistant issues, they have often yielded to quick resolution.

This kind of progress will be more possible as our efforts to broaden the availability of our natural science of behavior become more successful. Multiply this across all natural science and engineering disciplines and fields, where questions about behavior arise because these professionals are dealing with people at one level or another, and you will again see why the future can gain so much from a more widely understood behaviorology.

Reality

Those examples came from everyday reading. You have probably noticed similar examples many times in your own reading. Pursue them. The pre-scientific, mystical view of human behavior remains pervasive even after taking into account all the accomplishments of our discipline. But the culture has long enough endured the adverse implications of its wide spread investment in the superstitious treatment of behavior. The culture has long enough endured the adverse effects of the counter-productive sponsorship of disciplines that use scientific methods to pursue the implications of superstitious assumptions. And the culture has long enough endured the adverse outcomes when such disciplines ignore or deny or warp or suppress the evidence when the data imply that naturalistic assumptions are more appropriate. This reality makes clear what our future work involves.

While we continue to build upon our previous successes, we must also find ways to replace pre-scientific views of behavior with the natural science of behavior. We must do this in ways that gain the support of our colleagues in the other natural sciences. We must insure that our natural science discipline replaces fundamentally mystical disciplines as the accepted science of human behavior within our culture that informs society’s verbal behavior about behavior.

The first, and perhaps greatest, challenge for that task is to establish more firmly the independently organized natural science of behaviorology as an equal citizen of the natural science neighborhood—across the street from chemistry, next door to biology, and with physics just across the backyard alley. Our philosophy and science make us an equal partner in that community. To assert our place within it, our members must shed the distraction of the cultural mainstream. That superstitious cur-

rent is sweeping the culture down a drain. We should not purchase our passage through that maelstrom on some passing but inappropriately appreciated raft, like psychology, with the currency of our integrity. Instead, our mission, and our contribution, involves using scientific realities to divert that current to better prospects.

Within the global culture, natural science will remain the work of a minority for a very long time. As with members of the other natural sciences, the social security of individual behaviorologists inheres in the practical merit of their intellectual products. Natural scientists of behavior, like those here today, are poised to make the kinds of contributions to the future of humanity that we have discussed and which support our collective security. Whether ultimately called behaviorology as it is now, or called behavior analysis at some future time after that name has been cleared of its association with fundamentally mystical disciplines, the natural science of behavior not only faces a bright future, but helps create a bright future for humanity.✱

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Footnotes

¹The author thanks Jón Grétar Sigurjónsson, Jara Kristina Thomasdóttir, Páll Jakob Línal for organizing the conference in Iceland that served as the prompt for preparing this paper. The author also thanks (a) Zuilma Gabriela Sigurdardóttir of the Faculty of Social Sciences at the University of Iceland, Reykjavik, for her presentation support, and (b) Lawrence E. Fraley for providing helpful comments on an early draft of this paper.

²The author wrote this paper as an oral presentation of an invited address at the "Where is it now? The Legacy of Behaviorism in the 21st Century" conference at the University of Iceland, Reykjavik, 29 February 2004, a conference in honor of the 100th anniversary of B.F. Skinner's birth on 20 March 1904 [see p. 3 in this issue (Volume 7, Number 2, Fall 2004) of *Behaviorology Today*.—Ed.].✱

