# *Behaviorology in China: A Status Report*

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During the 1990–1991 academic year, I taught some English but mostly behaviorology courses in the People's Republic of China. I accompanied my spouse as part of a faculty exchange between her university, St. Lawrence University, and the Xi'an Foreign Languages University (XFLU) in Xi'an, Shaanxi. While there I held discussions, the chief source of information, with as many of the behavior science professionals as I could reach at different higher education institutions in Xi'an.

Upon my return many colleagues (both Western and Chinese) asked me to describe, *from my experience,* the status and directions of the natural science of behavior in China. Most of these colleagues, particularly those from China, requested that the description include the behaviorological context, a request with which I have tried to comply through references. Of course, "from my experience" means that, since preparing this report was not the point of my stay in China, I did not gather numerical data relevant to the expressed opinions and perceived trends mentioned herein. Perhaps those making future visits will collect appropriate data and report what more, or what else, those data tell us.

Circumstances (in some cases, the language barrier) kept the number of professionals I could contact small (fewer than ten). So I cannot guarantee that my comments or those of my sources represent the general views of China's behavior science professionals. But my sources were of the opinion that they did. They cited some interwoven factors to support that contention. (As the level of discussion did not involve data presentation, these factors are still speculative in nature.)

One such factor involves a culture–based propensity, unless the speaker has earned senior status, to qualify statements even when these have only a minimal chance of being wrong. For example, in casual conversation a junior faculty member is likely to say *"Perhaps* it has been raining" (emphasis added) when the window panes are observed to be wet, while a senior faculty member would forego the qualifier. This propensity is combined with a similar hesitancy to speak up in the first place unless you are sure you are right. My sources attributed these to the relatively large amount of "perhaps" culturally–determined embarrassment (loss of "face") experienced when one is in error in a context with a high population density as is common in China. Confidence that one is right, and hence a greater willingness to speak up, along with a reduction in qualifiers, gradually accrues with experienced seniority. As a result, what those with senior status say is acted upon out of respect for the speaker's status. The probability of verifying the statement is often reduced accordingly; the speaker is presumed to be right.

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This paper developed as a response to the requests of some of the author's Chinese and Western colleagues who were interested in the professional experiences the author had during his teaching year in China.

My sources believed these related factors reflect the hierarchical nature of the organization of disciplines and institutions in China wherein senior members do most of the talking and junior members play more of a supporting role. The result is that Chinese professionals tend to qualify their answers to probing questions in inverse proportion to their academic and professional seniority. As seniority increases, the number of autoclitics (Skinner, 1957) decreases. For Chinese speakers, seniority, as opposed to variables implying statement accuracy, seems to exert more control over autoclitic emission than is common for Western speakers.

I gathered information I consider reliable under these circumstances because some of my sources were senior members of the behavior science disciplines. For example, one professional with whom I held revealing in–depth discussions holds seniority at least as great as that of the others, and enough to reduce qualifiers considerably. This source is Professor Fang Qiang. The entries on his business card provide some measure of his seniority. These include (a) Professor, Northwest Institute of Political Science and Law, Xi'an, Shaanxi, (b) Director, Committee on Legal Psychology, Xi'an Psychological Association, (c) Deputy Director, Committee on Criminal Remolding Psychology, Chinese Society of Science of Law, (d) Member of the Committee on Legal Psychology of the Chinese Psychological Association, and (e) Member of the Preparatory Committee on Psychology in Literature and Arts of the Chinese Psychological Association. Professor Fang did not have the opportunity to comment on everything. The comments he made, however, did confirm information from other sources when he and they covered the same topics.

The major points I discovered about behavior science in China are all interrelated. The most obvious point pertains to the nature of "psychology" in China, especially the recent historical problem of a break with some counterparts outside China, counterparts the Chinese consider important. This break left the Chinese discipline in need of updating. After working on the update for ten years, the Chinese thought the task completed. They are discovering that it is not and that what is still missing is what some call behaviorology. However, for behaviorology to be adopted to finish the update, the other major points I discovered must be considered. These pertain to the nature of higher education in China with respect to (a) its extent, (b) its requirement for demonstrated applications from "new" disciplines (partly as a function of its structure), and (c) the resistance resulting from retaining comfortable even if outmoded opinions about behavior science (including opinions about its paradigm and its philosophy of science). Each major point will be addressed in turn, after a description of the relevant aspects of my teaching context that hold implications for understanding and acting on the question of behaviorology in China.

## Specific Context and Developing Behaviorology

My teaching situation exemplified some of the variables affecting the development of behaviorology in China. Hence, this section includes more than the usual details.

XFLU hired me to teach in two departments, English and Graduate Studies. Most of the college graduates in English from XFLU become language teachers, more than

80%, the majority in middle schools (similar to US high schools), according to department personnel. So the English Department asked me to teach an undergraduate teaching methods course to their "fourth grade" students (i.e., seniors) in the second semester. They called this course "Behaviorology and Teaching." Also, about 80% (by count) of the graduate students at XFLU *are* language teachers. So the Graduate Studies Department asked me to teach a graduate version of the teaching methods course at the same time. (I taught two sections due to the enrollment of other teachers as well as graduate students.) They called it "Behaviorology and Education." The content of both courses derived mostly from the textbook *Behaviorology for Teachers* (J. Vargas, 1988).

Most XFLU seniors take a traditional teaching methods course taught in their native tongue. This course surveys specific practices for particular circumstances (e.g., how to do vocabulary drills with second–year, junior middle–school students), plus theories and philosophies from various educational perspectives. That course spends little time discussing scientific foundations of teaching and learning. The "Behaviorology and Teaching" course replaced the traditional course for undergraduate English majors and (like its graduate–level counterpart) covered scientific foundations as well as the applications of these in education.

The Graduate Studies Department also asked me to teach a behaviorology course on verbal behavior (VB) in the fall 1990 semester, the first semester I was there. They gave the course the name "Verbal Behavior and Language Study." The purposes of the course were (a) to explore the behaviorological analysis of verbal behavior and (b) to examine the implications of this analysis for, and its applications to, the teaching of foreign languages. This department also offered a course called Psycholinguistics (only in the fall term of the academic year) which included coverage of Chomsky's language theories. Only English–speaking students could take these courses because the texts were in English for both of them. Due to subsequent demand, the Graduate Studies Department asked me to offer the VB course again in the following spring term.

Some students took both the Psycholinguistics course and the VB course. The comments from both students and faculty colleagues about Chomsky's theories are revealing. They told me that "Everyone in China who is involved in language training knows Chomsky's theories but, since applying them to language training is so difficult, if not impossible, few people show much interest in them; they are just something you are 'expected' to know."

When asked to teach these courses, especially the VB course, I expressed some concern: Starting with courses in advanced, specific application areas would sacrifice the more comprehensive understanding of fundamental principles and methodology that are necessary for skill development and successful work in applied areas. I further suggested that standard introductory courses would provide coverage of the main scientific principles and methods of behaviorology, preparing the way for advanced, applied courses, and that initially I should teach such an "Introduction to Behaviorology" course. But this suggestion received little attention, and I tried to find out why. The answer involves several interacting factors and helps show the complexity of some of the tasks facing those who would work to enable behaviorology to make its contributions to humanity's world–wide culture.

## The Nature of Psychology in China

The use of the word *psychology* to translate the entries on Professor Fang's business card provides an initial insight into psychology and behaviorology in China. Professionals there use the word differently, to encompass far more, compared to the way professionals in Western countries use it. The Chinese use a word they translate as *psychology* to encompass the three sources they currently see for their discipline: traditional Chinese perspectives, the perspectives from the discipline in the Soviet Union (especially the work originating with Pavlov on reflex/emotional, that is, respondent, behavior), and Western perspectives.

The Chinese have included three parts in the Western component of their discipline: psychoanalytic (e.g., Freud), mainstream (that is, cognitive/mentalistic; e.g., Maslow and Piaget), and behavioral (that is, the science of behavior originated by Skinner). The Chinese report a special preference for the Pavlovian and Skinnerian work due to the natural science approach and experimental methods these two share.

In part, this preference for Pavlov and Skinner may be due to a particular aspect of Chinese history. The Chinese culture has been less burdened than Western culture has been by philosophically idealist dualism, a dualism that pervades Western culture. So Chinese culture has suffered less from the unscientific separation of phenomena into the different realms of mental and physical (soul/body, spiritual/material, mind/reality) that results from philosophical dualism. Western psychology traditionally prefers the non–physical aspect. (The Chinese language, while it has a rich variety of terms for most of the Western usages of the term *mind,* actually lacks a direct translation of mind as Western psychologists use that term—as a dualistic, uncaused metaphysical cause. Instead, for that usage, Chinese generally uses a word that, less appropriately, translates back into English better as "brain.") The combination of being less affected by the dualism problem plus China's modern preference for philosophical materialism enables Chinese professionals interested in improving the human condition to achieve greater progress at a faster pace than their Western *psychology* colleagues. The extent to which China's professionals make such progress depends on the extent to which they maintain their preference for philosophically materialist natural science when considering disciplines pertaining to human behavior. Progress also depends on maintaining an advanced level in the natural science of behavior; historical circumstances have, however, made this difficult.

### *The Break in Contact with the West, and the Quest to Update*

The development of the Western components of the Chinese psychology/behavior science discipline has not been even. For thirty–odd years after the mid 1950s, Chinese psychologists were out of contact with the work, reports, and progress of their Western counterparts. Chinese psychologists spent the 1980s trying to rectify this situation. Their efforts to update the Western component of their discipline were many, including (a) short–term (one to three weeks) and longer–term (up to one year or more) personnel exchanges with their Western colleagues, (b) academic conferences both at home and abroad, (c) contact with current Western psychology journals and textbooks, and (d) Chinese students earning higher degrees (M.A. and PH.D.) in top–rated psych-

ology departments in the USA (e.g., Harvard). And they reported that they had believed that their efforts were virtually complete.

However, at the time of my visit, Chinese psychologists were coming to understand that their updating task was incomplete. They were seeing that their update had really been only of the psychoanalytic and mainstream components. Their update of the behavioral component had hardly begun because they did not realize that they were consulting sources that lacked the necessary information. The information they needed to complete their update has not resided in psychology or its literature since the 1960s. Increasingly in the 1950s, Western (American) psychology journal editors turned down behavioral studies partly because these studies lacked the technically required reports of statistical significance. In effect, those editors ignored the judgement (see Sidman, 1960 [1988]) that the *experimental* control methodology of behavioral research is scientifically more powerful than the *statistical* control methodology typically used in psychology. So behavioral researchers founded behavioral journals separate from the standard psychology journals and published their research in those behavior science journals as well as in their own behavior science textbooks. Their experimental methodology, with its emphasis on single subject designs, had produced, and continues to produce, discoveries of principles (see, for example, Fraley, 1996; Michael, 1982; Sidman, 1986a, 1986b; Whaley & Malott, 1971) and advances in practices and applications (see, for example, Beach, 1991; Christophersen, 1988; Clark, 1996; Cooper, Heron, & Heward, 1987; Epstein, 1981; Fraley, 1980; Johnson & Layng, 1992; Latham, 1994; Ledoux, 1982; Schlinger & Blakely, 1987; Sidman, 1989, 1994; Sidman, Wynne, Maguire, & Barnes, 1989; J. Vargas, 1988; West & Hamerlynck, 1992). These are all relevant to solving human problems and are related to further advances in extended analyses of complex human behavior (also see, for example, Cautela, 1994; Cautela & Ishaq, 1996; Fraley, 1988; Krapfl & Vargas, 1977; Skinner, 1957; Ulman, 1991; Vargas, 1996; Vargas & Fraley, 1976).

At the same time, in that decade of the 1960s, other developments were affecting the status of Western psychology. The so–called cognitive revolution, along with various economic and political contingencies (extensively analyzed in Fraley & Ledoux, 1997), gave rise to non–behavioral psychologists' increasing satisfaction with psychology's *transformation* paradigm. That paradigm is incommensurable with the *selection* paradigm of a natural science of behavior like behaviorology (see Vargas, 1991, for a thorough comparison of these paradigms; also see Fraley & Ledoux, 1997; Ledoux, 1997a). Psychology's transformation paradigm is also incompatible with the philosophy of science called radical behaviorism which informs behaviorology (for basics, see Ledoux, 1997b; for details, see Chiesa, 1994). Most of these developments happened after Chinese behavior scientists had lost contact with Western events.

As of this writing Chinese behavior scientists are realizing that they have been operating with a behavioral component that is over thirty years out of date. (They are also realizing that any dissatisfaction they may have had with the behavioral approach is as likely due to that factor as to any other.) By completing the update of this information, that is, by becoming familiar with behaviorology, Chinese professionals may decide to do some extensive re–evaluation of the relevance of the various components of their discipline, and perhaps even begin to shed the idealism–based parts.

Moves in this direction are already developing. Even the term Chinese professionals use for their behavioral component is noteworthy. That term is *Xingwei Xue* which the Chinese translate as *analysis of behavior, behaviorology, behavior analysis, behavior*

*science,* or *science of behavior.* (Unfortunately, this means that the Chinese language has no current term that connotes what English connotes with the term behaviorology: a separate and independent natural science discipline.)

Chinese professionals also expressed dissatisfaction with what they describe as a lack of useful substance in the psychoanalytic and mainstream psychology components which they have already updated. They find very little that can be put to use to help deal with some of the practical issues that they face in their culture and society. Those Chinese scholars introduced to the wide range of research and applications reported in well–known *behavioral* journals (e.g., *Journal of the Experimental Analysis of Behavior*, *Journal of Applied Behavior Analysis, The Behavior Analyst, The Analysis of Verbal Behavior, Journal of Behavioral Education, Behaviorology,* and *Behaviorological Commentaries/ The International Behaviorologist*) express ample interest in behaviorology. They know that what they have in China is out of date, and they want to examine and thoroughly familiarize themselves with, and expand, behaviorological science and technology.

In summary, since the late 1950s, reports of virtually all the numerous, significant advances in research and applications in the science of behavior have increasingly appeared in journals and textbooks independent of the in–house texts and journals of organized psychology. So these developments have not appeared in the traditional *psychology* sources the Chinese consulted for their update. While Western psychologists have, since the 1960s, often claimed "Behaviorism is dead" (see Wyatt, Hawkins, & Davis, 1986), in self–contradiction they have also continued to claim it as their own. Yet all that time their version of behavior science *within* psychology was getting more and more obsolete. This obsolete version was all that was available to Chinese scholars for their update *from within Western psychology.* The information needed to complete the update is available in the literature of behaviorological science. For, as psychology's information became obsolete, the science in the West that Chinese behavior scientists have seen as the behavioral component of their discipline was becoming the separate, independent discipline of behaviorology, with its own disciplinary literature (see Fraley & Ledoux, 1997; Ledoux, 1997a; Skinner, 1989, 1993).

## Developing Behaviorology: The Challenge for China's Higher Education System

### *The Extent of Available Training Opportunities*

Chinese scholars face certain challenges in developing behaviorology in their country. One concerns the small number of training opportunities available in China's education system, at least as of 1990. Even though China's population is well over one billion, the Chinese report that they have few higher education institutions in China, relative to the population to be served (the historical reasons for this situation go beyond the scope of this paper). Only a few of those institutions offer training in Chinese psychology (behavior science). Even then, "Education Science" is the name of the discipline in which students earn degrees.

The following institutions are reported to be the only ones offering that training at this time: Those institutions that offer it at the B.A. degree level are: Beijing University, Beijing Teacher's College, and East China Teacher's College in Shanghai. Training at the M.A. degree level is offered by the Shaanxi Teacher's University in Xi'an, Hangzhou

University, South West Teacher's College in Chong Qing, and the Northeast Teacher's University in Lan Zhou. Doctoral level training is offered at Beijing University, Beijing Teacher's College, and the Psychological Institute of the Chinese Academy of Social Science in Beijing. (A few others may offer this training, such as Beijing Normal University, but the specifics of their programs were unavailable.)

### *The Requirement: Demonstrate Useful Applications First*

Another challenge rooted in the circumstances of Chinese higher education is the apparent requirement that unfamiliar approaches (those that are "new" to China, in the sense of not currently being taught) demonstrate useful applications before receiving academic recognition, support, training in basics, and expansion. The difficulty here is that some of the most useful behaviorological applications are complex ones that *require* extensive attention to basics in the first place. How can this dilemma be resolved? Perhaps, by updating the old, still taught version of behavior science to behaviorology, this dilemma will simply be avoided. But that presents separate challenges, described in a later section, regarding the comfort of familiar, though outmoded, opinions.

The characteristics of my academic setting (described earlier) are typical results of the preference for applications first. These characteristics were: (a) the desire to have a behaviorology and education course taught that emphasized *applying* behaviorology to teaching methods and the high demand for this course, (b) the desire to have a VB course taught that emphasized *application* to language training and the high demand for and subsequent repetition of the VB course, (c) the low interest in Chomsky's theories "because they are not so useful/applicable," and (d) the current lack of interest in having *basic* behaviorology courses taught that introduce the discipline in depth rather than just emphasize a particular application area.

***The effect of the education system's structure.*** The structure of Chinese higher education may itself be partly responsible for the "demonstrate useful applications first" condition. This structure is based on a need for applied specialists, the demand for whom is continually greater than the supply available from China's limited number of institutions. Most higher education institutions in China have an applied mission in a particular area (e.g., a petroleum institute, an architectural–engineering institute, or a foreign language university—the American concept of "general education" is not widely known). Such institutions often do not comprehensively teach (i.e., as "majors" themselves) the disciplines that inform their respective areas of application. Only a few higher education institutions in China have a mission broad enough to allow them to teach disciplines comprehensively. Some can do so for only one or a few disciplines (e.g., a music conservatory or a teacher's university). The few, more comprehensive universities can do so for many disciplines, usually providing training through graduate degrees. (The latter institutions often train the faculty for other institutions.)

Those institutions with applied missions are always sensitive to the possibility that other, perhaps "new," disciplines may provide contributions that can increase the effectiveness of personnel working in the applied area of the institution. When they find such a discipline, they "try it out" and the amount of success it shows generates commensurate demand. If a discipline "tried out" this way shows enough success, and generates enough demand, then those institutions with broader missions may begin teaching it comprehensively.

For example, if those who took the applied behaviorology classes at XFLU are more effective as teachers of foreign languages, then other teachers of languages and of other subjects may become interested in such courses. Other institutions may then start teaching similar courses, such as teacher's universities. In time, the major universities would begin offering comprehensive training in behaviorology, in part simply to supply properly trained faculty to the applied institutions.

Such a scenario began even while I taught the first VB course. The discussions about offering the behaviorology and education/teaching courses, and the VB course repeat, began halfway through that first term as the usefulness of behaviorology's analyses became apparent. Word of this usefulness quickly reached the Shaanxi Teacher's University (STU), next door to XFLU. That institution then asked XFLU to allow me to teach a section of "Behaviorology and Education" to its students and teachers in the spring term. (STU had to withdraw the request for financial reasons as the compensation XFLU requested, an amount in addition to my stipend for that section but typical in such situations, was more than STU could afford.)

But all this presumes that students of applied courses will avoid the danger inherent in the "demonstrate useful applications first" requirement. This danger seems to cause less concern than it deserves. The danger of the applications–only approach, of course, is that students who take only one or two applied–focus courses will not have acquired, from those courses, repertoires—in the principles, methods, and skills of the science—sufficiently advanced to meet the challenges that they will likely face.

Advanced repertoires are necessary for the long–term effective application of the science. Students lacking these repertoires are likely to encounter complexities and problems that they cannot adequately analyze or solve. They should trace these difficulties to their inadequate preparation in the repertoires of the discipline. But that same lack of preparation may mislead them to suspect, instead, that the discipline itself is inadequate and so not worthy of further study. That conclusion, shared generally, could substantially reduce the chance for behaviorology to receive the attention that would generate full training programs capable of leading to comprehensive contributions.

Establishing behaviorology training programs in the near future in China that initially cover the full range of disciplinary breadth and depth may be unrealistic. Without demonstrating its applications first, behaviorology has little chance of recognition there (although the multitude of published applied research studies may be demonstration enough). A first step may be (a) to teach only the basic skills of various applications along with the basic principles that inform those skills *at that level only,* while (b) at the same time continually pointing out, especially by examples from the applied literature, how more sophisticated skills can be learned and effectively applied when the more advanced principles and methods of the science are studied. Students taught this way may indeed blame their minimal training when they face problems that they cannot solve. They may then seek further training and thereby create the demand for more comprehensive training programs. (See Ledoux, 1997c, for a discussion of behaviorology curricula.)

### *Resistance from Outmoded Opinion*

Another aspect of China's higher education that affects China's development of behaviorology is partly a function of the seniority–autoclitics relation described earlier.

This aspect concerns the amount of the science that is already known and the outmoded opinions about that knowledge that senior personnel may hold.

Repeatedly, Chinese colleagues pointed out that Skinner's work was followed through the 1940s and taught through the 1950s. But in the thirty years since then, little (including new advances) was available or taught. (Many disciplines faced this type of problem as a result of the derailing of the positive aspects of the Cultural Revolution by the Gang of Four.) Today, the behavior science being taught is mostly the knowledge available in the 1950s.

Chinese professionals' opinions of the "Skinnerian behaviorism" *that they know from the 1950s* too often hold that the principles of the science seem inadequate to account for the complexities of human behavior. The advances in the years since then, however, provide justification to change that opinion. This behavior science has proven as capable as, if not more so than, other disciplines in accounting for the complexities of human behavior. *Due to the lack of access to these advances,* however, many of China's behavior scientists have thought the science had stalled. Consequently, the low opinion of it went unchallenged. In a similar way, much of the credence Chinese colleagues have given to psychoanalysis and the cognitive/mentalistic mainstream may stem from the same factor. They have simply not had access to a suitable, more applicable, scientific, parsimonious, effective, and comprehensive alternative to those approaches. They are now appreciating that such an alternative is available.

## Contributory Action

As a citizen of this planet, every human being has a stake in the successful outcome of efforts to bring the benefits of the natural science of behavior, behaviorology, to all the world's peoples, including the people of so populous a country as China. People who wish to contribute to such efforts are unlikely to have their contributions refused.

Western behavior scientists can make valuable contributions. Reestablishing contact with Chinese colleagues and engaging in personnel exchanges and conferences between countries are good examples. These are similar to the procedures already in use for updating and maintaining contact. But they must now occur to support the efforts of China's scholars to develop *behaviorological* science. (See Latham, 1997, for an important, explicit, practical, and justified suggestion along these lines.)

Other types of contributions by Western behavior scientists may be especially valuable in supporting these efforts. For starters, transfers of resources (e.g., behavioral textbooks and sets of behavioral journals) to departments providing behavior science training would help improve training contexts immensely, with all the subsequent benefits to the quantity and quality of behavioral research and applications.

## Conclusion

The vast majority of Western psychologists lay claim to the level of behavior science available in the 1950s. They also often insist that behavior science is "dead" (Wyatt, *et al.,* 1986). Due to the advances outside psychology since the 1950s, the former is irrelevant. The latter is correct, but only *within* psychology; again, advances have been

made and reported mostly outside psychology, in the natural science discipline that has come to be called behaviorology.

The advances in behaviorological science since the 1960s show its principles accounting for complex human behavior, and further advances are to be expected (for example, see Ledoux, 1997d, 1997e). If behaviorology in China is to become a part of, and inform, the cultural–practice repertoire of the fifth of the world's population living in that country, then the resources of the whole discipline (with the advances since the 1960s, including the paradigm and other developments leading to separate disciplines) must be more thoroughly introduced to the professionals concerned with behavior in China for extension within that cultural context. For that introduction to be successful (with behaviorology being added to university curricula, leading to higher degrees and China's own laboratories and research in the science), the outdated opinions about behaviorological science must be modernized, and the "applications first" dilemma must be addressed and resolved. Expansion of training opportunities will follow, along with improvements in the behavior– and cultural practice–related services for the people of China and beyond. Material and intellectual contributions are appropriate actions in support of our Chinese colleagues in their efforts to meet these challenges.

## Endnotes

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## References

Beach, S. (1991). Behaviorology and space settlement. *CONTACT Newsletter, 2* (2), 2–3.

Cautela, J.R. (1994). General level of reinforcement II: Further elaborations. *Behaviorology, 2* (1), 1–16.

Cautela, J.R. & Ishaq, W. (Eds.). (1996). *Contemporary Issues in Behavior Therapy: Improving the Human Condition.* New York: Plenum.

Chiesa, M. (1994). *Radical Behaviorism: The Philosophy and the Science.* Boston, MA: Authors Cooperative.

Christophersen, E.R. (1988). *Little People (Third Edition).* Kansas City, MO: Westport Publishers.
Clark, L. (1996). *SOS! Help for Parents (Second Edition).* Bowling Green, KY: Parents Press. (Also available in Chinese.)
Cooper, J.O., Heron, T.E., & Heward, W.I. (1987). *Applied Behavior Analysis.* Upper Saddle River, NJ: Prentice–Hall. [Second Edition: (2002). Pearson Education.]
Epstein, R. (1981). Of pigeons and people: A preliminary look at the Columban simulation project. *The Behavior Analyst, 4,* 43–55.
Fraley, L.E. (Contributing Editor). (1980). *Behavioral Analyses of Issues in Higher Education.* Reedsville, WV: Society for the Behavioral Analysis of Culture.
Fraley, L.E. (1988). Covert mini–courts within judicial and law enforcement operations. *Behavior Analysis and Social Action, 6* (2), 2–14.
Fraley, L.E. (1996). *General Behaviorology: The Natural Science of Human Behavior*. Morgantown, WV: Lawrence E. Fraley. Also: 2008, Canton, NY: ABCs.
Fraley, L.E. & Ledoux, S.F. (1997/2002). Origins, status, and mission of behaviorology. In S.F. Ledoux. *Origins and Components of Behaviorology—Second Edition* (pp. 33–169). Canton, NY: ABCs. Reprinted (2006–2008) in five parts in *Behaviorology Today:* Chs. 1 & 2: *9* (2), 13–32. Ch. 3: *10* (1), 15–25. Ch. 4: *10* (2), 9–33. Ch. 5: *11* (1), 3–30. Chs. 6 & 7: *11* (2), 3–17.
Johnson, K.R. & Layng, T.V.J. (1992). Breaking the structuralist barrier: Literacy and numeracy with fluency. *American Psychologist, 47* (11), 1475–1490.
Krapfl, J.E. & Vargas, E.A. (Eds.). (1977). *Behaviorism and Ethics.* Kalamazoo, MI: Behaviordelia.
Latham, G.I. (1994). *The Power of Positive Parenting: A Wonderful Way to Raise Children.* Logan, UT: P and T.
Latham, G.I. (1997). China through the eyes of a behaviorologist. In S.F. Ledoux. *Origins and Components of Behaviorology.* Canton, NY: ABCs. Also printed (1998) in *TIBI News Time, 1* (1), 4–7. Reprinted (2002) in *Behaviorology Today, 5* (1), 17–20.
Ledoux, S.F. (1982). *Control of Simultaneously Reinforceable Concurrent Human Operants by a Multiple Reinforcer–Source Procedure.* Doctoral dissertation, Western Michigan University, Kalamazoo. Reprinted, with extensive revisions, as "Multiple selectors in the control of simultaneously emittable responses" in (1997) S.F. Ledoux. *Origins and Components of Behaviorology.* Canton, NY: ABCs. Reprinted (2010) in *Behaviorology Today, 13* (2), 3–27.
Ledoux, S.F. (1997a). An introduction to the origins, status, and mission of behaviorology: An established science with developed applications and a new name. In S.F. Ledoux. *Origins and Components of Behaviorology.* Canton, NY: ABCs. Reprinted with revisions from (1992) *Behaviorological Commentaries, Serial No. 3,* 11–31. Reprinted (2004) in *Behaviorology Today, 7* (1), 27–41.
Ledoux, S.F. (1997b). An introduction to the philosophy called radical behaviorism. In S.F. Ledoux. *Origins and Components of Behaviorology.* Canton, NY: ABCs. Reprinted with revisions from (1992) *Behaviorological Commentaries, Serial No. 4,* 3–10. Reprinted (2004) in *Behaviorology Today, 7* (2), 37–41.
Ledoux, S.F. (1997c). Behaviorology curricula in higher education. In S.F. Ledoux. *Origins and Components of Behaviorology.* Canton, NY: ABCs. Reprinted with revisions from (in press) *The International Behaviorologist, 1.* Reprinted (2009) in *Behaviorology Today, 12* (1), 16–25.

Ledoux, S.F. (1997d). Increasing tact control and student comprehension through such new postcedent terms as added and subtracted reinforcers and punishers. In S.F. Ledoux. *Origins and Components of Behaviorology.* Canton, NY: ABCs. Reprinted with revisions from (in press) *The International Behaviorologist, 2.* Reprinted (2010) in *Behaviorology Today, 13* (1), 3–6.

Ledoux, S.F. (1997e). Successful smoking control as an example of a comprehensive behaviorological therapy. In S.F. Ledoux. (2002). *Origins and Components of Behaviorology.* Canton, NY: ABCs. Reprinted (2011) in *Behaviorology Today, 14* (1), 3–13.

Michael, J.L. (1982). Distinguishing between discriminative and motivational functions of stimuli. *Journal of the Experimental Analysis of Behavior, 37,* 149–155.

Schlinger, H. & Blakely, E. (1987). Function–altering effects of contingency–specifying stimuli. *The Behavior Analyst, 10,* 41–45.

Sidman, M. (1960). *Tactics of Scientific Research.* New York: Basic Books. Reprinted, 1988, Boston, MA: Authors Cooperative.

Sidman, M. (1986a). Functional analysis of emergent verbal classes. In T. Thompson & M. Zeiler (Eds.). *Analysis and Integration of Behavioral Units* (pp. 213–245). Hillsdale, NJ: Erlbaum.

Sidman, M. (1986b). The measurement of behavioral development. In N.A. Krasnegor, D.B. Gray, & T. Thompson (Eds.). *Developmental Behavioral Pharmacology* (pp. 43–52). Hillsdale, NJ: Erlbaum.

Sidman, M. (1989). *Coercion and its Fallout.* Boston, MA: Authors Cooperative.

Sidman, M. (1994). *Equivalence Relations and Behavior: A Research Story.* Boston, MA: Authors Cooperative.

Sidman, M., Wynne, C.K., Maguire, R.W., & Barnes, T. (1989). Functional classes and equivalence relations. *Journal of the Experimental Analysis of Behavior, 52,* 261–274.

Skinner, B.F. (1957). *Verbal Behavior.* New York: Appleton–Century–Crofts. Reprinted, 1992, Cambridge, MA: The B.F. Skinner Foundation.

Skinner, B.F. (1989, May). A world of our own. Major address presented at the fifteenth annual convention of the Association for Behavior Analysis, Milwaukee, WI.

Skinner, B.F. (1993). A world of our own. *Behaviorology, 1* (1), 3–5.

Ulman, J.D. (1991). Toward a synthesis of Marx and Skinner. *Behavior and Social Issues, 1* (1), 57–70.

Vargas, E.A. (1991). Behaviorology: Its paradigm. In W. Ishaq (Ed.). *Human Behavior in Today's World* (pp. 139–147). New York: Praeger.

Vargas, E.A. (1996). A university for the twenty–first century. In J.R. Cautela & W. Ishaq (Eds.). *Contemporary Issues in Behavior Therapy: Improving the Human Condition* (pp. 159–188). New York: Plenum.

Vargas, E.A. & Fraley, L.E. (1976). Progress and structure: Reorganizing the university for instructional technology. *Instructional Science, 5,* 303–324.

Vargas, J.S. (1988). *Behaviorology for Teachers.* Morgantown, WV: L.E. Fraley.

West, R.P. & Hamerlynck, L.A. (Eds.). (1992). *Designs for Excellence in Education: The Legacy of B.F. Skinner (Limited Edition).* Longmont, CO: Sopris West.

Whaley, D.L. & Malott, R.W. (1971). *Elementary Principles of Behavior.* Englewood Cliffs, NJ: Prentice–Hall.

Wyatt, W.J., Hawkins, R.P., & Davis, P. (1986). Behaviorism: Are reports of its death exaggerated? *The Behavior Analyst, 9,* 101–105.♣