

FRED S. KELLER: REMEMBERINGS

MURRAY SIDMAN

NEW ENGLAND CENTER FOR AUTISM

Ever since Rick Shull asked me to prepare an essay of appreciation of Fred Keller, I have found myself putting it off. Somehow, something else was always needing to be done. Finally, I realized what was happening. I just did not want to face the fact that Fred was no longer with us. After a relationship that extended over more than 50 years, during which Fred taught me both pedagogically and by example, it is not easy to deal with the fact that the personal interaction I had come to value and, I realize now, to depend on, is no longer possible. The same is true for Rita, who had come to love Fred (he was fond of calling her "Rio Rita") even without having been his student. Knowing how much Fred meant to all in the behavior-analytic community, I am certain that many others, too, have found it difficult to come to terms with his departure. Fortunately, we still have Frances, without whom our relationship with Fred would only have been half of what it actually was. But we have to face reality, and one of the functions of preparing and reading an essay like this is to help us.

I have already said much about Fred Keller by revealing that in preparing a memorial essay, I feel a greater need to talk about personal relationships than about professional accomplishments. This does not contradict my philosophic conviction that one *is* what one has *done*. What Fred did in his professional and personal activities is reflected in the behavior of others. That, after all, is the bottom line in evaluating accomplishment. Unless one influences the conduct of others, one leaves nothing behind. That is what we mean when we say that Fred was one of the great teachers: He changed the behavior of countless others and continues to do so even though he is no longer with us.

Also, I need not expound in detail on Fred's many formal accomplishments because these are known both from his own

record and from the writings of others (e.g., American Psychological Association, 1977; Cook, 1996; Dinsmoor, 1989, 1990; Keller, 1970, 1977, 1982; Kerbauy, 1983; McGill, 1989; Nevin, 1989; Sidman, 1989, 1995; Stebbins & Moody, 1989). Instead, by speaking more personally about my own relationship with him, I know that I will be touching on the experiences of many others, and that by beginning to come to grips myself with his leaving us, I may help others do the same.

I have always regarded my teachers—that is to say, anyone who taught me—with special respect, but that respect went not to people who *professed* to be my teachers, only to those from whom I actually learned. Fred Keller knew that most professors, in fact, rarely teach anybody anything. Indeed, when he (and Nat Schoenfeld) first kindled my interest in and excitement about behavior analysis—in that first undergraduate lab course at Columbia—I thought I was hearing about that work for the first time. Later, as a graduate student (hot on a research trail that Keller had started with his studies of rats escaping from bright lights; Keller, 1941), I discovered an old book of notes I had taken during an introductory psychology course many years earlier (1941–1942), a course in which Professor Keller had lectured about such things as operant conditioning, reinforcement, extinction, discrimination, and so on. I did not remember ever having heard those terms before taking the lab course. In lectures—even Professor Keller's lectures—it had not taken. My school record shows that I received a C– and a C in the two semesters of the lecture course.

This was no news to Fred. The normal curve that described his students' scores on the final exams was enough to tell him that lectures taught *most* students little. Fred was always painfully aware of the strong possibility that a student's failure was really his—the teacher's. As graduate assistants in the course, we learned not to send complaining

Address correspondence to the author at 242 Beacon Street, Boston, Massachusetts 02116-1232.



Fred and Frances Keller at the meeting of the Southeastern Association of Behavior Analysis (SEABA), November 1987. (Photograph by William B. Pavlik)

students in to see the professor because the student would always win the argument. The professor was way ahead of his course assistants.

As we all know, he never ceased trying to find ways to teach more effectively. The undergraduate lab course that Keller and Schoenfeld developed at Columbia was one of his first attempts (Keller & Schoenfeld, 1949). Replications of the course at Columbia and elsewhere are still bringing first-class students into the scientific analysis of behavior. The text (Keller & Schoenfeld, 1950/1995) covered most of what was contained in the traditional introductory psychology course, even while asking students to think systematically and to learn a new language. I have recommended elsewhere (Sidman, 1995) that with the addition of only a few new facts, this book will still help students to learn that be-

havioral contingencies are real and must be taken into account if the students are to understand and do something about society's problems. Although cautious in his extrapolations, Fred was always on the lookout for applications of reinforcement theory to practical affairs.

Another effort in that direction was his development of the astonishingly effective "code-voice" system for teaching the Morse code to military personnel who were being trained to become radio operators (e.g., Keller, 1943, 1953, 1958). While in the service during World War II, I learned the code that way, without even knowing that the lecturer in my recently taken (and almost failed) elementary psychology course had anything to do with it—that he was teaching me without even being there. He had come up with an effective teaching technique, one based on

behavioral principles and, most important, one that did not depend on any particular instructor. *Anybody* could do it! When I returned to Columbia after the war and met Professor Keller again, my radio-operator experiences helped to develop a closer bond between us.

Perhaps his most universally applicable accomplishment was his development of the principles and methods of what has become known as the Keller Plan or the personalized system of instruction (PSI). There is no need for me to describe or even comment on PSI here (see, e.g., Born, 1970; Keller, 1968; Keller & Sherman, 1974, 1982; Sherman, 1974; Sherman, Ruskin, & Semb, 1982). What I would like to dwell on more than just a bit is the fact that PSI was introduced in Brazil, when Fred and his Brazilian students started the elementary psychology course at the brand-new University of Brasília in the country's brand-new capital city. The Brazilian connection became most important to me, both personally and professionally, and cemented my and Rita's relationship with Fred and Frances as nothing else could possibly have done.

My own first visit to Brazil came some 22 years after Fred's introduction of PSI. I was asked to take part in a symposium at the annual behavior analysts' meeting, a symposium to celebrate the 25th anniversary of the publication of *Tactics* (Sidman, 1960). I had not known that behavior analysis was active in Brazil, that they had conventions devoted to it, or that my book was known there. I quickly discovered that all of this was directly traceable to one Professor Fred S. Keller. The science of behavior analysis was—and is—strong in Brazil, with new laboratories and new research areas continuing to open up. All of this is an outcome of Fred's beginnings with PSI and with the introductory lab course (beginnings that Gil Sherman followed up most effectively). Those first Keller students are now the leaders not only in behavior analysis but more generally, in psychology, in science, and in university administration, and *their* students are beginning to succeed *them*.

I learned quickly that Professor Keller had not only earned professional respect in Brazilian psychology circles, but that he (and Donna Frances) were loved by all. That is the way Brazilians are. They are openly affection-

ate and loving, sensitive and responsive to similar regard by others. Well, we all know of this special feature of Fred Keller's behavior; he was "Mr. Positive Reinforcement," making all who met him feel that he had singled them out for special high regard, and generating a reciprocal feeling.

This happened even when Fred visited students working in their cubicles in the PSI course that Michael Terman had instituted at Northeastern University. He would ask them questions as if he knew nothing about the course and, as always, considered the students' comments seriously. Afterward, students would come up and ask, "Who *was* that wonderful man?" Actually, it was not even necessary to interact with him directly. One day, Fred, Frances, Rita, and I were sitting in an old-fashioned ice cream parlor eating ice cream cones and talking. After a while, a man who had been sitting near us got up, came over to Fred, and said, "Excuse me, sir, I hope you will not take offense, but I think you are the most distinguished-looking person I have ever seen." And with that, he was off into the crowd. Even while Fred sat there licking an ice cream cone, something special had shone through.

Brazilians also extend their regard and affection to other associates of *their* Professor. Rita and I were beneficiaries of that extension. When the time came for me to thank the symposium participants who had spoken so kindly about my book, I had come to understand the linkage between me and most of the several hundred in the audience; I greeted them as my siblings, nieces, nephews, grand-nieces and grand-nephews, and so on. I could not have said anything that would more effectively have established the close relationship that has since developed between me and our Brazilian family.

One of Fred's least known writings was published only in Brazil, in the Portuguese language (Keller, 1987). That little book, *Peter Opossum Goes to School*, is an illustrated allegory of PSI that should rank with "Good-bye, Teacher . . ." as an exposition of the system. It showed that PSI might well be carried out not just in colleges but in grade schools, too. Always alert for opportunities to use behavioral principles in new ways, Keller inserted a paragraph in which he adapted the code-

voice method to the teaching of number naming:

[Freddy Fox, the advanced student/proctor] had a record-player with him and a pack of number cards. "Here is what you will need for Activity Number 4," he said.

Freddy then showed Peter how to start the record player, guess the name of the number shown on the top card of the pack, and then listen to see if his guess was right. Every time that Peter was correct, he put the card on the bottom of the pack. If he made an error, he put it in a separate pile.

Peter worked at this till Freddy came back again to see how many numbers Peter had learned to name. Then it was time for lunch.

"By tomorrow noon," he said, "you will probably be through with Unit 1. Miss Raccoon will come to test you then. If you know all the numbers from 0 through 10, she will put it on the card that you take home. Then you can start on Unit 2."

"Will that be my Report Card?" asked Peter.

"Yes," said Freddy. "Every time you pass a unit you will get one. Miss Raccoon will also keep a record in a book with your name on it. The book shows everything you learned and when you learned it. But now it's time for lunch." (p. 21)

Fred Keller (Freddie Fox?) was not only an intellectual father of us all—just as he was here and in other parts of the world—but in Brazil, he generated all the emotional reactions normally extended to a beloved biological parent. The first sentence of the translator's introduction to the Peter Opossum book is "Fred Keller é um vovozinho adorável" ("Fred Keller is an adorable little grandfather"). I shared that with the Brazilians—and, of course, with Fred's and Frances' children, John and Anne. The one occasion on which Fred and my biological father—both born in 1899—actually met was a great moment in my life. (The Experimental College of the Institute for Behavioral Research conferred an honor upon me, and both of them felt it important to be there.) And so, family we are—Rita, I, and our and Professor Keller's Brazilians.

Perhaps one has to visit Brazil before one can really appreciate how remarkable the Keller/Brazil story is. From small beginnings—attempts merely to introduce effective teaching methods in a small area of science—Fred introduced a new and flourishing field of be-

havioral science into a new country, influenced countless numbers of people whose native language was not even English, became a beloved symbol (with Donna Frances) throughout a country larger than the continental United States (the contiguous states), and brought about the establishment of the closest personal ties among individuals from our two countries. I see the continuation of the Keller/Brazil story as perhaps *my* most effective way of coming to terms with Fred's passing. He has left many other paths for others to follow.

And finally, I would like to report some of the things others have said. After Frances called to tell me and Rita about Fred's passing, I sent e-mail messages to a number of those who, I knew, would want to know, even though the news was sad. Many of these, and others to whom the word spread, sent expressions of loss via e-mail. I would like to share just a few of those expressions because they indicate the range and multifaceted nature of this man's influence. In order not to infringe on anyone's privacy, I will keep the comments anonymous:

I appreciate getting this news from you. Yes, it is no surprise in one sense but it is not easy, as you say, and something we do not take for granted. . . . I am glad to have talked to him so recently and, in fact, concerning the circumstance that in my dissertation I had a chance to see reinforcement principles working with humans—something not all had in this field. I said, "Thank you." He seemed to like that. I am in his debt, though nicely so, and will miss him.

Of course, we knew that he was very sick but somehow he seemed so immortal! . . . I cannot write more at the moment; the words don't come. I can just say that all his "gang" is in mourning! [This note, one of several from his original Brazilian students, was the first of many to cry, "Adeus, Mestre" ("Good-bye, Teacher").]

I am sad now that I never got to meet him. I wish I had.

To talk with him or to hear him give a talk was an experience one would always remember: his gentle demeanor, his sharp wit, his perfect sense of timing, his humility, and his humanity.

. . . this gentle, caring, brilliant, nurturing man . . .

He inspired a few of us to practice what he (and we) preached. . . . I am fully aware of the difficulty of starting PSI courses and the likelihood of experiencing aversive consequences for doing so. But who ever claimed that doing the right thing would be easy?

Our thoughts went back to a warm autumn in Palermo, in 1994, where he gave, as far as we know, his last public speech during a scientific meeting. This speech will be published in the proceedings of the meeting which will be dedicated to Fred Keller. . . . We are very sympathetic to Frances, whose sweetness and kindness are still in our hearts.

How sad, Fred Keller is no more. I am at this moment writing from South East Asia, Malaysia. . . . I also remember him for his article, "Good-bye, Teacher . . .," but I have lost the exact reference. Could someone please give me the exact reference to this poetry/article? I would like to preserve it.

He will be with us, always.

The course in which I was taught PSI was doubtless the most meaningful course I ever had in grad school. And why not? It was a "practice what you preach" approach to teaching educational psychology. I'm sure that I am one of hundreds who feel this way.

It was his students and his students' students who formed the largest and most influential body of behavior analysts in the early years. . . . Lists of those behavior analysts who took their degrees with Fred Keller and of those who took their degrees with a student of Fred Keller will be the finest tribute to him and will assure his memory. . . . What a great man. What a nice man, a kindly man.

Some people should be eternal. I realize now that this is the way I always felt about Professor Keller, that he would be always there with the same wise and happy look. In a certain sense, that may well happen, as far as our memories go, but we will miss him anyway.

So many people knew and loved him. I am still unable to restructure my feelings and say anything coherent about his loss. His charm, which he put to the betterment of psychology; his kindness, which he put to the betterment of us all; his genuine love of teaching and his true concern regarding his students' learning; his commitment to behavior analysis. . . . It is much too great a loss.

Both our grand Freds are now gone. We must doubly delegate ourselves to maintaining their traditions and extending and expanding their accomplishments.

REFERENCES

- American Psychological Association. (1977, January). Distinguished contribution for applications in psychology award for 1976. *American Psychologist*, 32, 68–71.
- Born, D. G. (1970). *Instructor manual for development of a personalized instruction course*. Unpublished manuscript, Center to Improve Learning and Instruction, University of Utah.
- Cook, D. A. (1996). Fred S. Keller: An appreciation. *The Current Repertoire: The Newsletter of the Cambridge Center for Behavioral Studies*, 12, 2, 6–7.
- Dinsmoor, J. A. (1989). Keller and Schoenfeld's *Principles of Psychology*. *The Behavior Analyst*, 12, 213–220.
- Dinsmoor, J. A. (1990). Academic roots: Columbia University, 1943–1951. *Journal of the Experimental Analysis of Behavior*, 54, 129–149.
- Keller, F. S. (1941). Light aversion in the white rat. *Psychological Record*, 4, 235–250.
- Keller, F. S. (1943). Studies in international Morse code. 1. A new method of teaching code reception. *Journal of Applied Psychology*, 27, 407–415.
- Keller, F. S. (1953). Stimulus discrimination and Morse code learning. *Transactions of the New York Academy of Sciences*, 15, 195–203.
- Keller, F. S. (1958). The phantom plateau. *Journal of the Experimental Analysis of Behavior*, 1, 1–13.
- Keller, F. S. (1968). "Good-bye, teacher . . ." *Journal of Applied Behavior Analysis*, 1, 79–89.
- Keller, F. S. (1970). Psychology at Harvard (1926–1931): A reminiscence. In P. B. Dews (Ed.), *Festschrift for B. F. Skinner*. New York: Appleton-Century-Crofts.
- Keller, F. S. (1977). *Summers and sabbaticals: Selected papers on psychology and education*. Champaign, IL: Research Press.
- Keller, F. S. (1982). *Pedagogue's progress*. Lawrence, KS: TRI Publications.
- Keller, F. S. (1987). *Pedro Preguiça vai à escola*. [Peter Oposum goes to school]. São Paulo: EDICON.
- Keller, F. S., & Schoenfeld, W. N. (1949). The psychology curriculum at Columbia College. *American Psychologist*, 4, 165–172.
- Keller, F. S., & Schoenfeld, W. N. (1995). *Principles of psychology: A systematic text in the science of behavior*. Acton, MA: B. F. Skinner Foundation, Copley Publishing Group. (Original work published 1950)
- Keller, F. S., & Sherman, J. G. (1974). *The Keller plan handbook: Essays on a personalized system of instruction*. Menlo Park, CA: W. A. Benjamin.
- Keller, F. S., & Sherman, J. G. (1982). *The PSI handbook: Essays on personalized instruction*. Lawrence, KS: TRI Publications.
- Kerbauy, R. R. (Ed.). (1983). *Fred Simmons Keller*. São Paulo: Ática.
- McGill, W. J. (1989). Time past, time present, time future. *The Behavior Analyst*, 12, 197–202.
- Nevin, J. A. (1989). Keller, Schoenfeld, Cumming, and Berryman as instructional stimuli. *The Behavior Analyst*, 12, 221–225.
- Sherman, J. G. (1974). *Personalized system of instruction: 41 germinal papers*. Menlo Park, CA: W. A. Benjamin.
- Sherman, J. G., Ruskin, R. S., & Semb, G. B. (1982). *The personalized system of instruction: 48 seminal papers*. Lawrence, KS: TRI Publications.

- Sidman, M. (1960). *Tactics of scientific research: Evaluating experimental data in psychology*. New York: Basic Books.
- Sidman, M. (1989). Avoidance at Columbia. *The Behavior Analyst*, 12, 191–195.
- Sidman, M. (1995). Foreword. In F. S. Keller & W. N. Schoenfeld (Eds.). *Principles of psychology: A systematic text in the science of behavior*. Acton, MA: B. F. Skinner Foundation, Copley Publishing Group.
- Stebbins, W. C., & Moody, D. B. (1989). Concerning the hallmark of a discrimination. *The Behavior Analyst*, 12, 203–211.