For Students of Behavior Analysis

A Teleconference with Professor Fred S. Keller

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One of the founders of the science of behavior, Fred Simmons Keller was born in 1899. He received his bachelor's degree at Tufts (College) University in 1926 and his MA and PhD degrees from Harvard in 1928 and 1931, respectively. He taught psychology at Tufts College, Colgate, and Columbia University (where he became Professor Emeritus of Psychology in 1964). He has also taught at the University of São Paulo and the University of Brasília in Brazil, Arizona State University, and Western Michigan University, and he occupied an Honors Chair for a term at Texas Christian University. Professor Keller's numerous awards include the Certificate of Merit from President Truman in 1948 for his research during World War II, the Distinguished Teaching Award from the American Psychological Foundation, a Distinguished Contribution for Applications of Psychology Award from the American Psychological Association, and a Pioneer Psychologist Medal from Brazil.

As a teacher, Professor Keller directly influenced many individuals who went on to distinguished careers as scientists, teachers, and practitioners. He is author or coauthor of several textbooks in psychology and many papers in the areas of animal learning, human skill acquisition, and instructional methods. Two contributions for which he will always be remembered are his coauthorship of the

classic textbook, *Principles of Psychology* (Keller & Schoenfeld, 1950), and his development of the Personalized System of Instruction (PSI) (Keller, 1968), often referred to as the "Keller plan."

B. F. Skinner had this to say about his good friend and long-time colleague:

No one has more consistently furthered an experimental analysis of behavior or clarified its implications. Impatient with the commonplace, the standard, the too readily accepted, he has broken into new and exciting fields and has taken a host of others with him. He is a prospector who has never staked a claim but who has shown many others where the gold is to be found. (1977, p. ix)

On December 3, 1992, Professor Keller, the self-described "oldest living behaviorist in the world" (Keller, 1992a, p. 1), served as guest faculty member for Ohio State University's Teleconference on Applied Behavior Analysis. For a description of the teleconference format and its benefits to students and faculty, see Heward (1989). The teleconference was attended by 20 students, alumni, and faculty who prepared for the session by reading two papers selected by Professor Keller (1992a, 1992b) for the occasion. The following questions and responses by Professor Keller were selected from the 90-min seminar.¹

OSU: What influenced you to become a behaviorist?

Keller: It probably goes back to my childhood. I had a very poor education,

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¹ The following people participated in the teleconference with Professor Keller: graduate students—Dan Bullara, Gregg Drevno, Jim Dunne, Fred Haertel, Kelly Heckaman, Kim Killu, Jonathan Kimball, Rick Kubina, Stacy Martz, Mwajabu Possi, Philip Ward, and Kimberly Weber; alumni from OSU's PhD program in applied behavior analysis—Jim Cowardin and Teresa Grossi; faculty—John Cooper, John Eshleman, Ralph Gardner, Tim Heron, Bill Heward, and Diane Sainato.

and it got worse as we went along. I dropped out of school and got a job. Pretty soon I got another job, and then I was off to the army. While in the army, I had a friend who was planning to go to college, but had to go for a year of schooling first. I had completed only about 2 years of high school—rather bad years of high school, I should add. This fellow said, “Why don’t you go with me? There’s a prep school in Vermont we can get into. We’ll play football.” Sure enough, he and I got football scholarships. I didn’t learn much there, but I did get certified to get into Tufts College. I managed to get through 4 years at Tufts; having considerable trouble, doing well only in a few subjects like English literature. I was very good in that; I sometimes got Bs and As.

After 4 years at Tufts I left, without a degree, and went to work for a printing house that sold yearbook printing to colleges. In the course of doing that job, I was told I’d have to sell to business people at times, not just colleges. Well, I had heard somewhere that if you took a course in advertising you could learn how to talk to people who might buy your printing if you helped them with their advertising. So I took an advertising course in Boston. The man who taught it said that, to understand advertising, we ought to learn more about psychology. I thought this might be good advice, so I immediately went to the Old Corner Bookstore and bought a book on psychology. It was a salmon-colored book called *Psychology from the Standpoint of a Behaviorist* (Watson, 1924), and I still have it in my library. As I commuted back and forth on the train, I read that book and got pretty interested in this psychology stuff. I remembered I had a logic course once in college, taught by a psychologist, and it was the first class I ever did well in other than in English literature. So I went back and asked my Tufts psychology professor if there was any chance I could learn something practical in that field. He told me to go see a fellow in Framingham who was an applied psychologist—a man who tested people for different jobs at the Denison manufacturing company. When I talked with this man, he said I couldn’t

do anything with psychology without at least a masters degree. So I went back and told this to my teacher, who said, “Why don’t you come back to school for a year and just major in psychology. We’ll teach you all we can, and then maybe you can get into a graduate school.”

So that’s what I did, working very hard and passing all my courses without any trouble. The second of my psychology teachers at Tufts was a Harvard PhD, and one day he walked me over to Harvard to meet Professor Boring, the head of the Psychology Department. Boring said, “I can give you 5 minutes.” He set a timer on his desk and asked us what we wanted. My teacher said, “I’d like to recommend this young man for graduate study here, and I thought you ought to meet him.” So we talked, and when the 5 minutes were up, Professor Boring said, “OK, maybe we can make an experimentalist out of you, Keller.” And that’s how I came to study psychology at Harvard. I spent the next 5 years learning a lot that was not very useful to me later.

OSU: What reinforced your interest in behaviorism as a graduate student at Harvard in a department filled with some of the most renowned psychologists of the day, but who were, as you’ve described, at best indifferent, and at worst hostile, to behaviorism.

Keller: Most of my behavioral foundation in that period was obtained from reading. I read everything I could. I tried to understand the philosophers as well as the psychologists. Then along came this other student—Burrhus Skinner. He and I had similar interests. He had read John Watson, too. Some of it at least, not as much as I had. But he had managed to get a pretty good grasp of the early system. Skinner and I became a little clique. We began to spread the word of behaviorism amongst the other graduate students. I think you could say we started a kind of an interest in it.

OSU: Tell us what the psychology program at Columbia was like when you were teaching there.

Keller: It began with the first course. Everything followed from that first course. We used Keller and Schoenfeld

(1950) as the text in an unpublished form. The first course also included animal experiments, which I recommend for any beginner in our field. They acquaint you with the possibility that you can control behavior in general through reinforcement. We started that course in 1946, I believe, and at that time we had only about 10 majors in psychology per year. Later on we had 10 times that many. We got more students, and better qualified students, once we got that first course going. We had some really first-rate men—Columbia had only male students at that time—Murray Sidman was one, Donald Cook was another, and several other now well-known behavior analysts were connected with our program as graduate students or undergraduates.

Columbia was really an exciting place at that time. Everybody was helping everybody else; there was a wonderful spirit in the whole group. No one was trying to outdo anyone else. There were enough problems to go around. It was a dynamic, exciting world. I can't think of any better way of indoctrinating students into the science of behavior. And I mean indoctrination in the finest sense of that word.

OSU: This question is prompted by your memories-of-psychology article (Keller, 1992b). When one compares life in the 1920s to life in the 1990s, there seems to be a great difference in the quote unquote values that drive our culture. In contemporary life, we're witnessing random violence and, in general, large-scale disrespect for the lives and property of one another. From your unique perspective as the self-described "oldest living behaviorist in the world" (Keller laughs), would you identify some of the variables that may be at the root of this apparent decay?

Keller: Well, I do believe things are much changed from the 1920s. The major change in our society that I have seen is the loss of the *community*. In my day everyone was part of a community, even in the biggest cities. Your part of the city, your community, was distinct from the others. The community held us together and helped dictate our morals. If you got into trouble someone would say, "Listen

Freddy, I'm going to tell your dad if you keep that sort of thing up. You better not do that." Members of the community treated you as one of their own. And it was a good thing. I find that kind of control especially lacking in today's world.

OSU: What advice do you have for behavioral educators? How can we best promote and advocate effective instruction?

Keller: I guess the best advice I ever heard was offered by a friend of mine, Burrhus Skinner, during a talk in Pittsburgh some years ago. Someone in the audience asked him what we can do to promote better education. Skinner was silent for a moment, then he said, "Well, I guess we just keep nibbling." I take that to mean to keep on working in a small way, keep on promoting good things. When you see something good taking place, reinforce it if you can. When you see something going in the right direction, praise it. Anytime you see a model school that looks as if it's applying good behavioral principles, give it your support. Every time you hear of somebody doing something good, drop him or her a line and say, "Thank you very much for what you're doing." I believe the process is something like shaping. Don't expect many big changes to take place. There's not going to be any revolution. But maybe, if we all keep on nibbling, we can change education. I don't know of any other way.

OSU: In the paper you gave at the first International Congress on Behaviorism, you state that after writing and speaking on behalf of PSI for many years your days of PSI promotion were over (Keller, 1992b). What, if anything, would you do differently if you were starting to promote PSI all over again?

Keller: I don't know what I could have done differently. Of course, I was naive. I thought that if you had a better mouse trap, people would come running to your door. So when we found and reported a better way of teaching at Arizona State, we thought people would come running. Actually, one lady did come, all the way from St. Louis, I think it was. And maybe there were one or two others interested

in what we were doing. So I wrote a paper describing the system (Keller, 1968). Then I started getting called upon to give, I don't know how many, papers and presentations on PSI. That part of the history is mentioned in the paper you read. I kept this up because I believed in it, and because people kept asking me to do something about it. They asked me to speak here and speak there. Well, I spoke, but that didn't change things very much.

The enemy is many-headed; it's like a hydra. And not all of the heads know what the other heads are doing. Education is a very difficult thing to break into. We've all got our interests; we've all got our pet objectives. We don't like to be disturbed in our way of life, or made to think afresh about things. I think it's quite natural that we find great, great obstacles whenever we promote any important change. Small changes: yes, they're O.K. so long as they don't make much difference or step on too many toes. But I think big changes are almost impossible.

While I was at the meeting in Mexico, Francis Mechner advised me to start at the top. Mechner said to get all of the bigwigs together, don't ever start at the bottom, don't start with the teachers, or the students. Go up to the top and put enough pressure on the high-level people. Well, I'm not that good a salesman; if I were, I might still be with that college yearbook company. (Keller chuckles.)

OSU: There are numerous advantages to PSI, that benefit the student as well as the instructor. But then there's also some response cost for the teacher and possible problems, such as students procrastinating and lack of support from faculty colleagues and administrators. How can an instructor eliminate or minimize some of the problems that have been reported with PSI?

Keller: Most of the reported problems with PSI, alleged problems I should say, would not be present if the system were properly employed. When someone says, "This PSI looks like a pretty good thing, but I'm going to change it a little bit. For one thing, we have to consider the fact that we'll have too many As, so I'm then going to have the students write a paper.

I'm going to have students do this, that, or the other for credit and grades." This is the beginning of the end. The more you change PSI in order to meet the requirements of your local situation, the more it becomes no different from what it's replacing. When PSI is properly introduced, I guarantee it will work. It is a positive way of making good students, of teaching students how to study, teaching them how to write. But when you introduce variations here and variations there, it's no longer the same system.

Let me tell you a story. PSI has had especially good success in college-level science courses. There's a chap at the University of Texas at Austin, for example, who's used it for nearly 30 years now. He's been very successful in teaching nuclear physics with it. This guy's an engineer, and he told me that the first thing an engineer does when he tries a new method is to try it exactly as it was described. Only after this test will he make whatever changes that may be suggested by the initial application. But first do it the way the developers said it should go. Unfortunately, that is not how PSI has been implemented in most cases. PSI gets changed almost beyond recognition, and you end up with what Ben Green used to call SLI—Something Like It. My advice is this: If you aren't willing to try the whole system as described, or you don't have the complete support of your administration and other key people around you, don't even try PSI. It's just a waste of time and it gives a bad name to the system.

OSU: What do you see as the one or two priorities that the behavior analysis community should try to achieve in the 1990s?

Keller: That's a hard question. But I'll go back to what I said earlier. Let's stay at it, keep a low profile, don't pretend to do what we can't do, and don't think we've got all the answers to all the problems in the world. And don't go away from the lab, keep the lab in mind at all times. That's where we got our first ideas, and that's where we'll get more really great ideas. Work steadily and reinforce your friends in every way you can. Work

steadily and give credit where credit is due. Find good wherever you can in the work of others, no matter whether you agree with their basic positions or not. If you find something good in it, reinforce it.

OSU: You spent your professional life growing up with telegraph machines and manual typewriters. Students today are growing up in an age of computers, fax machines, electronic mail, and it's said that information doubles about every 10 years now. Do you have any suggestions for how we can help our students, as well as ourselves, keep up with everything?

Keller: Well, I haven't been able to keep up. I cannot keep up. I don't know how to use a computer. I have an old-fashioned Olympia typewriter that I bought in 1965. In fact, I've got to have the platen changed on the thing because my typing is getting pretty faint. I don't have any machinery around me that I don't understand. Simple things keep me busy. It's enough to keep up with the kind of simple world that I live in. Recently I've been pestered though. Several friends keep pestering me to get a word processor. Well, my hands are getting pretty old and those things go off if you just touch them.

OSU: Sometimes a teacher will say, "If you remember nothing else I've taught you, remember this" (and then goes on to provide some profundity we are supposed to remember forever). What sage advice do you offer to carry us through even if we should forget all else?

Keller: Oh dear! You folks are tough, you're pretty tough. Well, how about this? You don't have to be a genius to make a living. (Keller laughs.)

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