What Is a Great Experiment?

A Review of

Opening Skinner's Box: Great Psychological Experiments of the Twentieth Century
by Lauren Slater

Reviewed by

Robert J. Crutcher

In the introduction to Opening Skinner's Box: Great Psychological Experiments of the Twentieth Century, the author declares that the experiments described in her book “deserve to be not only reported on as research, but also celebrated as story” (p. 3). It is unfortunate that in telling these stories, too much of the science that is also part of the story is sacrificed. The book focuses on personalities and personal anecdote with little substantive discussion of the great experiments that are the stated subject of the book. Though interesting, provocative, even controversial, these stories of the great experiments are incomplete and distorted. The saving grace of the book may be that it forces us to ask: What is a great experiment?

As I began the first chapter, “Opening Skinner's Box,” I was eagerly looking forward to reading about Skinner’s great experiment. However, there are few details regarding Skinner’s experiments in the chapter—only summary descriptions of Skinner's experiments on variable reinforcement schedules and his success in getting rabbits to drop coins in piggy banks and cats to play pianos. In fact, the discussion of Skinner’s studies seems merely a ruse to discuss the dramatic and controversial implications of Skinner's work. “His experiments are disturbing in their implications. On the other hand, his discoveries are absolutely significant. They, in essence, illuminate human stupidity, and anything that illuminates stupidity is brilliant” (p. 15). It is the moral and social implications of Skinner's studies, their relevance for questions about free will and determinism that concern the author here more than any scientific contribution of Skinner's work to psychology. Moreover, like many of the stories in this book, this one focuses on the personality of the researcher, the puzzle of Skinner himself, suggesting that “we have viewed the man too simply. It seems we boxed him before he could quite box us” (p. 29). There is considerable discussion of the effects of the “baby box” in which Skinner raised his daughter and of the controversy generated by the reporting of this material in Ladies Home Journal. There is even an account of the author's own attempt to apply Skinnerian principles to her baby’s crying (by not reinforcing or responding to the baby crying in the middle of the night) that produces a quiet baby but guilty parents: "But sometimes now, we cannot sleep, my husband and I“ (p. 21). In short, there is plenty of drama but little that would help readers understand why Skinner’s
experiments are great experiments. The chapter concludes with a bizarre account of the author's visit to Skinner's former home in Cambridge, where she reports taking a bite out of a piece of chocolate that Skinner was eating when he died. Slater reports,

And then, pulled by some string I cannot see, a cue I never knew was coming, or perhaps a streak of utter freedom (for I do not know the answer after all this, I don't know the answer), I raise my arm—or my arm is raised—and I put the chocolate in my mouth. (p. 31)

Is this strange incident actually true or a bit of fiction merely meant to dramatize the dilemma of Skinner's work and its challenges to ideas of free will? I can't decide, but this incident and others like it that appear throughout the book make it difficult to trust the book's reporting.

This rather odd beginning sets the stage for the dramas that unfold in the succeeding nine chapters of Slater's book. In one way or another, these chapters are more about the individual researchers and their lives—the dramatic contradictions between their scientific goals and their personal idiosyncrasies—than about the great experiments of the 20th century. Loftus, for example, is described as a daring individual whose research on repressed memories challenged the established wisdom about memory, yet as personal details concerning her life accumulate, the author implies that Loftus is perhaps a bit unstable: “She is strange, I think, a little loose inside” (p. 184). Such personal detail detracts from any serious discussion of Loftus's research by making the narrative not about a great experiment but about a daring crusader of repressed memories who is herself possibly plagued by unpleasant memories that she'd like to forget. It is perhaps less dramatic but more accurate to report that Loftus's work underscores what memory researchers have known since Bartlett: that memory is fallible and less than perfectly veridical and that one of the reasons for its fallibility is its constructive nature. The “Lost in the Mall” experiment may not qualify as one of the great experiments in psychology to my mind, but it is a very good experiment nonetheless. However, what seems to suit Slater's narrative here is the controversy that Loftus's testimony and writing on the topic of repressed memory generates.

Opening Skinner's Box succeeds in calling attention to important social and moral issues raised by some of the classic studies of psychology, issues that were sometimes the focus of the study and sometimes generated by the way in which a specific study was conducted. Milgram's study, for example, raised serious questions about what people might do when subjected to the pressures of authority and at the same time generated questions about the appropriate treatment of human participants in psychological studies. Harlow's experiments raised questions about the proper use of animals in psychological research. It is unfortunate that any serious analysis of such moral or social concerns is often undermined by the way in which science and personal anecdote are mixed together in the narrative.

A good example is the author's account of the well-known Rosenhan study in which David Rosenhan and colleagues successfully faked hearing voices and were subsequently diagnosed as schizophrenic and committed to mental institutions. This study had considerable impact when it was initially reported in Science and raised serious questions about the validity of psychiatric diagnosis.
However, serious questions were not only raised by the study but about the study. Researchers pointed out flaws with the study (e.g., Spitzer, 1975). Although some of Spitzer's arguments are described in the chapter, it is really Spitzer himself as another player in the drama about psychiatric diagnosis who is important here. Instead of a thoughtful analysis of Spitzer's (or any psychologist's) published critiques, readers read telephone exchanges between the author and Spitzer, the accuracy of which readers cannot assess. Careful discussion of the research published by these individuals would be much more useful in evaluating the merits of Rosenhan's study. Instead, the author reports about her own attempt to replicate Rosenhan's experiment by seeing whether she could get herself committed to a hospital in the same way that Rosenhan did. In fact, she was not committed but diagnosed as possibly suffering from a “touch of psychosis” (p. 87) and prescribed the antipsychotic drug Risperdal. So instead of carefully evaluating the evidence for and against the validity of psychiatric diagnosis, the author simply “replicates” a flawed study. This approach of testing claims (with herself serving as sole subject) is employed by the author in other chapters, as she reports, for example, testing claims about the validity of addiction by taking morphine for 16 days to see if she can later quit of her own free will. Such anecdotal evidence may make for dramatic storytelling but is dangerous in making valid inferences about serious research questions such as the causes of addiction.

One positive effect of reading this rather disappointing book may be that it forces the reader to ask an important question: What is a great experiment? Slater's selection seems based not on the scientific merits of these studies (in fact, she questions the legitimacy of psychology as a science) but on the moral or social issues raised by these studies. What other criteria might characterize a great experiment? There are probably no criteria that could be universally agreed on, but in looking at several well-known books on the history of psychology and on the great or classic experiments in psychology (e.g., Garrett, 1951; Hilgard, 1987; Hock, 2005; Hunt, 1993; Schwartz, 1986), I came up with some criteria that might provide a useful start.

First, a great experiment is a first. A great experiment does not simply raise bold questions but offers bold, new answers. A great experiment provides new empirical data, a new explanation or theory for a phenomenon, a methodology that provides new data or insights. Ebbinghaus's experiments on human memory, for example, were the first successful effort to empirically study and measure memory. Similarly, Pavlov's studies on classical conditioning and Thorndike's on instrumental learning were important breakthroughs in the study of learning and established general theoretical principles of learning.

Second, a great experiment exerts a strong effect on subsequent research and the questions researchers choose to investigate. Hilgard (1987) used the term reference experiments to label experiments that serve as models for researchers conducting research within a specific area, influencing not only the questions asked, but the selection of specific tasks and task variables. Thus, Ebbinghaus's experiments served as models for countless subsequent memory experiments that focused on simple associations. In a similar way, Bartlett's work on reconstructive memory later inspired another generation of researchers in a different way. Even if the theory underlying a great experiment is later modified, an experiment remains important because of its continuing influence on
Third, great experiments are often elegant in design and clear-cut in the interpretation of their results. As a result, more often than not, they are readily understood by those outside the field. They are the studies published in *Science or Nature* and in books on the great experiments. The studies of Latané and Darley, for example, were simple and elegant and dramatically challenged conventional explanations for why people may fail to act in emergencies. Similarly, Sperling’s work on the visual icon elegantly and clearly demonstrated that hidden mental processes could be identified and measured objectively.

Finally, great “experiments” are often actually experiments. The issue of control is critical in psychology. Experiments are the most effective way possible of controlling for extraneous variables, and some of the great experiments received that designation in part “because of the skill the experimenters exercised in controlling extraneous variables” (Schwartz, 1986, p. 4). This is not to say that all great studies in psychology should be experiments, but any book about the great experiments in psychology should clearly distinguish between experiments and other types of studies. Schwartz, for example, carefully distinguished between experiments and other types of studies and noted that although experiments are accepted by scientists as the best way to gain scientific knowledge by virtue of the systematic manipulation of an independent variable and the control of extraneous variables, not all studies are experiments nor are all the classic studies experiments. There are competing factors or concerns that may necessitate sacrificing some degree of control. Nonetheless, it is important to be clear about what is an experiment and what is not. *Opening Skinner’s Box* never even mentions the distinction despite the fact that some of the studies described in the book are not experiments.

Many of the experiments discussed in *Opening Skinner’s Box* are great experiments but perhaps not for the reasons the author emphasizes. Slater writes, “Our lives, after all, are not data points and means and modes; they are stories” (p. 3). Quite true, but psychology’s story critically depends on those data points; without them there would be no story to tell. In conclusion, readers looking for a story about the great psychology experiments that places little emphasis on the scientific importance of the studies but instead emphasizes the social and moral controversies generated by these experiments may enjoy reading *Opening Skinner’s Box: Great Psychological Experiments of the Twentieth Century*. On the other hand, readers looking for a book that tells the story of psychology’s great experiments complete with characters, plot, and data points might be better advised to read Garrett’s (1951) *Great Experiments in Psychology* or Schwartz’s (1986) *Classic Studies in Psychology*.

---

**References**


Books.