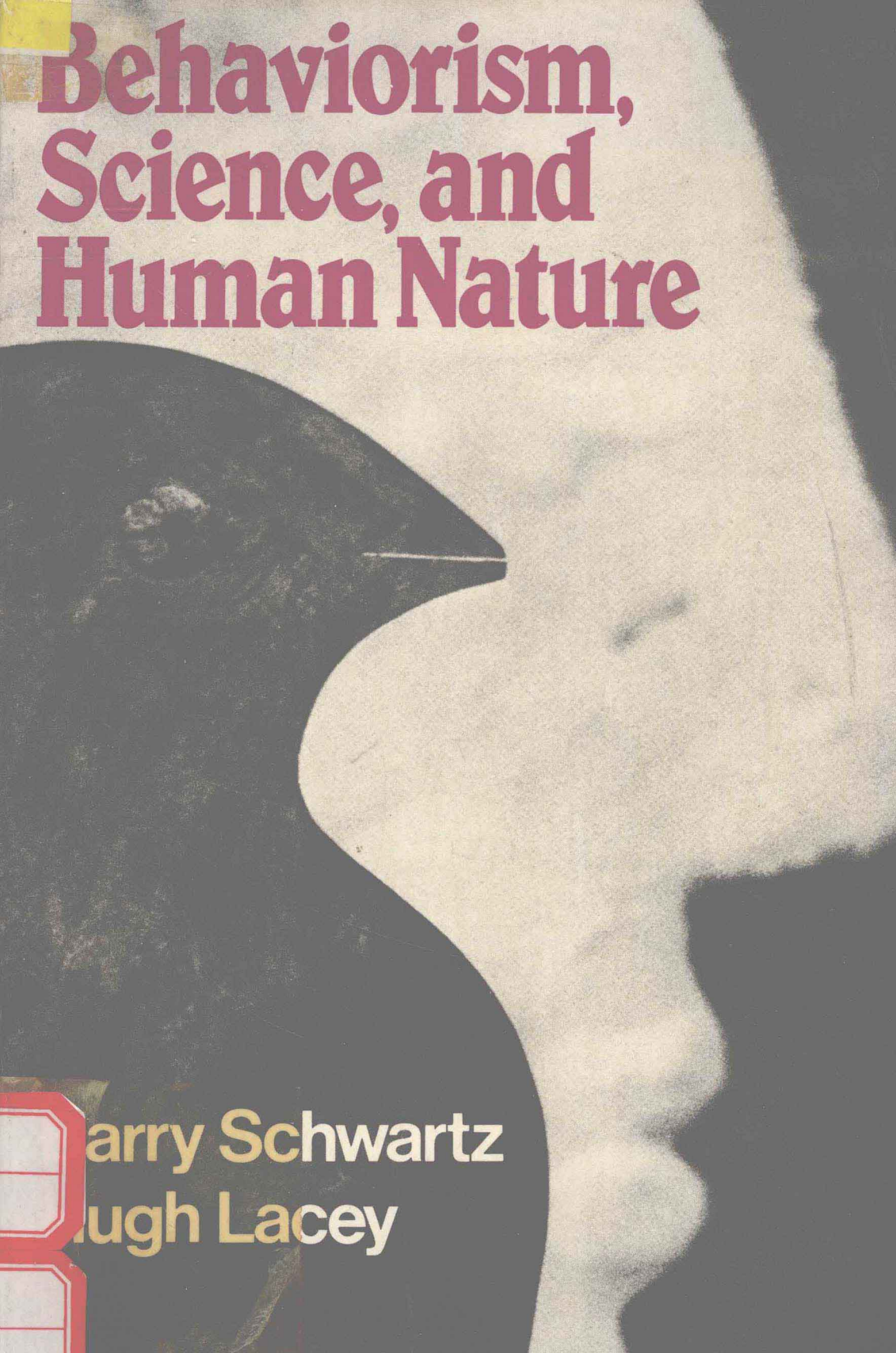
Behaviorism, Science, and Human Nature



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Behaviorism, Science, and Human Nature

Preface

SINCE the seventeenth century, the growth of modern science has rapidly accelerated. New developments in physics, chemistry, and biology have brought about largely through experimental investigation, the discovery of empirical principles of ever-increasing sophistication and scope. In the light of these principles, many natural phenomena can now be explained and predicted. These principles have also resulted in technological applications that serve human ends. It is only in the present century that serious attempts have been made to focus the scientific lens directly on human affairs. Behaviorism represents one of the most sustained and important of those attempts. Behaviorism uses methods of science to predict and control human and animal behavior. It has established a rigorous and ongoing research program that is now more than sixty years old, and has met with some notable success.

There are two sides to behaviorism. On the one hand, there is a body of research done in well-controlled laboratory settings, primarily with animals as subjects, that has produced a set of well confirmed empirical principles. These principles have in turn been applied successfully in a number of well-controlled contexts with humans. The other side of behaviorism has been considerably broader in scope. This side—most clearly exemplified in the writings of B. F. Skinner—has argued that the methods of behaviorism can go far beyond the well-controlled laboratory or applied setting—that eventually, behaviorism can hope to offer a *complete* account of human behavior.[1] The grand designs of behaviorism are extremely controversial. Few would doubt that the behaviorist research program has yielded principles

1. Skinner, B. F. *Beyond freedom and Dignity.* New York: Alfred A. Knopf, 1971.

that will contribute to our understanding of human behavior, but many dispute that behaviorist principles can eventually constitute that understanding.

In this book, we explore both sides of behaviorism—the tradition of experimentation and application in narrowly circumscribed settings, and the attempts to extend behaviorist principles to all aspects of human life. In Chapters 1 and 2 we examine the behaviorist's assumptions about human nature, and about the methods appropriate for studying human nature. Then, in Chapters 3 through 6, we discuss the essential principles and phenomena of behaviorist research: Pavlovian and operant conditioning. In Chapter 7, we examine the evidence that these principles of conditioning might have only limited applicability in the natural environments of animals, and that in these environments, principles other than those recognized in the tradition of behaviorist research may be significant. In Chapter 8, we present and assess critically the applications of behaviorist principles in a number of different human environments. It is on the successes of the applications that behaviorism's more sweeping claims about human nature rest.

In Chapter 9, we present an argument that while the principles of behaviorism on which these successes are based do apply within some social contexts in the contemporary human world, there is good reason to believe that there is a well-defined limit to this applicability, a limit that is revealed not by the methods of experimental inquiry, but by the methods of historical inquiry. In short, the view that has guided us in writing this book is that it makes a difference, both to our judgments about further research and to our evaluation of the significance of the principles, to know whether the principles of behaviorism are general principles of human behavior, or whether they apply only in special circumstances. In this book, we introduce and discuss the positive achievements of behaviorism in a context that permits the reader to address the issues, and perhaps evaluate them.

Over an extended period that preceded the writing of this book, we have both gained significantly in our understanding of behaviorism, science, and human nature from our discussions and collaboration with Richard Schuldenfrei. Chapter 9 bears the most explicit mark of this collaboration, as it is largely derived from an earlier paper written by all three of us.[2] But Schuldenfrei's contribution to

2. Schwartz, B., Schuldenfrei, R. & Lacey, H. M. "Operant psychology as factory psychology." *Behaviorism*, 1978, *6*, 229–254.

our thinking is also reflected throughout the book. In addition, we have learned from Paul Rozin of the University of Pennsylvania and John Staddon of Duke University, whose critical comments on earlier drafts of the book forced us to modify, and we hope, sharpen some of our ideas. We also wish to thank May D'Amoto of Brooklyn College, Mark Kristal of the State University of New York, at Buffalo, and Joseph Margolis of Temple University, for all of their comments on the manuscript. And Norton editor Don Fusting has helped us through all drafts of the book, greatly improving its clarity of organization and exposition. Finally, we are grateful to Didi Beebe, for typing, copying, cutting and pasting all of these drafts, always with good cheer and remarkable speed.

Lacey acknowledges the support of National Science Foundation Grant SOC 790 7600 and expresses thanks to Maria Ignes Lacey for first introducing him in a usefully critical way to the contributions and problems of behaviorism.

Schwartz has also had support from the National Science Foundation (Grant BNS78-15461) as well as the James McKeen Cattell Foundation, and the Swarthmore College Faculty Research Program, during preparation of parts of the manuscript, and for the conduct of some experiments that are described in it.

Barry Schwartz
Hugh Lacey
Swarthmore, Pa., 1981

Behaviorism, Science, and Human Nature

Contents

Chapter 1

Understanding Human Nature

ONE of our most distinctive qualities as human beings is our persistent effort to make sense of the world around us. Whether we are children or adults, farmers or professors, members of highly technological or of primitive cultures, a substantial part of our daily activity involves attempting to understand the events that affect our lives. The child strives to understand how to please its parents, how to balance a bicycle, where birds go in the winter, and why little stones sink in water while big boats float. The farmer seeks to understand the weather, how his tractor works, how to improve crop yield, what determines the market price of his product, and how to get his children interested in staying on the farm. The professor wants to know what caused the Second World War, the nature of genetic coding, the fundamental elements of matter, the meaning of Hamlet's crisis, and how to keep the students interested. The primitive hunter wants to know how to track animals, what may appease the gods, why the moon is not in the sky every night, and how to keep peace with the neighboring village.

The range of human concerns, of phenomena we seek to understand, is enormously varied, and differs from culture to culture, and from group to group. What people will accept in the way of an explanation is also quite varied. Explanations that satisfy a child may not satisfy an adult; those that satisfy an adult may mystify a child. The primitive hunter might listen to the professor explain the motion of heavenly bodies, and wonder how anyone could be so confused as to ignore the power of the gods, just as the professor might marvel at how anyone could believe that offerings to gods affect the weather. And the farmer might be puzzled at how a person could go to school

for as many years as the professor did, and still learn nothing that was of any practical value to anyone.

Our quest for understanding is so regular a part of life that we may hardly notice it. We simply take it for granted that people seek understanding, and that seeking understanding needs no justification. We are curious, and there need be no limits to where our curiosity will lead us. But it is not just curiosity that motivates our search for understanding. Often, our desire to understand springs directly from our practical life. We attempt to understand certain phenomena because we wish to change them, or to prevent them from recurring, or to make them recur. Put more generally, we want to be able to intervene effectively in the course of events. We want to be able to control our environment. That is why the farmer seeks to understand the weather, agriculture and market economics. That is why the primitive hunter seeks to understand the gods. And that is why the young child seeks to understand bicycles and its parents.

How we understand an event can have a dramatic impact on what we do about it. Consider the different ways we might understand the energy crisis. We might understand it as an artificial crisis, created by oil-producing nations so that they can increase the price of their oil. If so, we might try to solve the problem by political and economic means, attempting to establish some leverage in the policy formation of these nations. Or we might understand it as a reflection of our careless and excessive use of fossil fuels. If so, we might impose substantial taxes on the fuels to influence people to use them more sparingly. Or we might understand it in terms of an inexorable depletion of these fossil fuels, so that ultimately, supply will never be able to keep up with demand. In this case, we might direct our efforts toward the development of alternate energy sources, like solar and nuclear power. The way we decide to understand this current event can have a dramatic impact on our future. And if we were to choose to pursue one of these courses of action exclusively, we would in essence be making a bet that our understanding of the problem was correct.

Understanding and Science

Because of this close relation between how we understand something and what we do about it, a particular orientation toward understanding has become increasingly dominant in the industrialized world

over the last three centuries. It is the orientation reflected in the activities of natural science. Every aspect of life in our highly technological society testifies to the power of scientific modes of understanding to explain our world. Every time we turn on a light, or drive a car, or take a photograph, or turn on the television, or photocopy a letter, or compute our income tax with the aid of a calculator, we are presenting ourselves with evidence that science has delivered the goods. The kind of understanding that characterizes science is what has led to all of these technological innovations, and to the extent that they enable us to control our environment better than we could before, they are validating the scientific conception of the world.

This book addresses a particular application of that scientific conception. In the last century several scientific approaches to understanding human nature have developed within psychology. One of them, known as behaviorism or behavior theory, is an attempt to apply the experimental methods of natural science to the study of human nature. If it succeeds in discovering important generalizations about human nature, it will change the way we think about ourselves in significant ways. In this book, we will be presenting a picture of behavior theory—of its methods, its discoveries, its applications, and its general theoretical principles. We will also be evaluating whether or not it represents a successful application of the methods of science to the human domain.

But before discussing behavior theory itself, let us explore scientific understanding more generally. What is the scientific conception of the world? What does it mean to understand a phenomenon scientifically? While the specific features of scientific understanding will differ from one domain of science to another, there are certain characteristics which are shared by all the sciences.

Searching for Causal Laws

In attempting to understand a given phenomenon, the scientist searches for some other event or phenomenon that caused it. What does it mean to say that one event caused another? Though there is considerable controversy about what "cause" means precisely, we can identify some characteristics that most causal explanations share. Suppose we are interested in explaining the following phenomenon: You drop an expensive antique vase, and it falls to the floor and shatters into a hundred pieces. What caused the vase to fall and shatter?

Your response to this question might be "I dropped it." Let us

examine some of the properties of this "causal" explanation. First, the cause you identified was an event that initiated a process that culminated in the phenomenon to be explained. Dropping the vase initiated the process of its falling, which culminated in its reaching the floor and shattering. Other conceivable causal accounts, such as for example, accounts that invoked the phases of the moon, would not obviously have this property. Second, the causal agent you identified was external to the phenomenon being caused. Dropping the vase is easily separable from the behavior of the vase itself. Other conceivable accounts, for instance, one that suggested it was the vase's destiny to fall and break, would not have this property. Third, the cause you identified was such that under the circumstances, had the cause not occurred, the phenomenon would not have occurred. Thus, if you had not dropped the vase, it would not have fallen and broken. What we might say is that dropping the vase was *necessary* for it to fall and break. But your cause was only necessary *under the given circumstances*. Had the circumstances been different (for example, an earthquake causing the floor and table on which the vase was standing to shake), the vase might have fallen without your intervention. Again, we could imagine other causal accounts (you were engaged in a heated argument with your friend and weren't paying attention) which do not obviously have this property. Fourth, under the circumstances, the cause you identified was all that was required to bring about the phenomenon. Thus, once you dropped the vase nothing else had to happen for it to fall and break. What we might say here is that dropping the vase was *sufficient* for it to fall and break. Again, notice that your cause was only sufficient under the circumstances. If you had dropped the vase while holding it over a mattress, it would still have fallen, but it would not have broken.

Thus we see that your causal explanation of the behavior of the vase identifies an agent external to the vase itself, whose action is necessary and sufficient to result in the vase's falling and breaking. Does this mean that "I dropped it" counts as an appropriately scientific explanation of the behavior of the vase? Not quite. For what is perhaps the most significant feature of scientific explanations is that they relate the specific phenomenon to be explained to other, similar phenomena. At the heart of scientific explanation is the search for *generalizations* or *laws*. While the fact of the matter is that this particular vase may have fallen and broken after you dropped it, we know that it would have fallen and broken no matter who dropped it. Indeed, we know

that the fact that it was dropped is not essential to its falling and breaking. We know that no matter what is responsible for setting a vase in free fall, it will move toward the earth. Moreover, we know that the object needn't be a vase. Any object in free fall will move toward the earth, and any object composed of certain classes of materials will break when it contacts the hard ground. In addition, we even know the rate at which objects in free fall in a vacuum will approach the ground. They will accelerate at a rate of 32 feet per second each second they are in motion. Finally, we know that the cause of the behavior of the vase is the same as the cause of the motions of the planets. For when you say that the vase fell and broke because you dropped it, what lies beneath your explanation is a wealth of knowledge from physics about gravity and its effects on objects in free fall. It is this knowledge of physics that tells us to what general class of phenomena the behavior of the vase belongs. Without knowing this, we might still be able to say that the vase fell and broke because we dropped it. But we would not necessarily be able to use this knowledge to help us understand other phenomena, or perhaps predict or control events in the future.

Suppose for example, you think the vase fell because you dropped it, but you also think that this phenomenon belongs to the class of phenomena controlled by the gods, along with say, good harvests. With this understanding, you might pray to the gods in an effort to promote good harvests and prevent destroying precious objects. How you generalize a particular phenomenon has a lot to do with what you do about it in the future. Science is an attempt to discover which kinds of generalizations will provide the broadest and most powerful guidance about what to do in the future. When we said before that science has delivered the goods, what we meant was that the generalizations it has provided have enabled people to predict and control the world in which they live with unparalleled success. That is why the kind of understanding reflected by science's search for general, causal laws has become a model of what understanding should be in the technologically advanced world.

That scientific understanding involves generalizations, or laws, is significant for another reason. It is only because our claim that *a* caused *b* implies a claim about classes of events, *A* and *B*, to which *a* and *b* belong, that we are able to evaluate our causal judgments. Consider again the fallen vase. You believe the vase fell because you dropped it, and gravity took over. Someone else believes the vase fell