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Retrospective Feature Review

In Appreciation of E.R. Hilgard's Writings on Learning Theories

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It is rare that a scientific textbook is so well written and intelligently reasoned that it substantially organizes and structures an entire research discipline for generations to come. Hilgard authored two monumental texts, *Conditioning and Learning* (Hilgard & Marquis, 1940) and *Theories of Learning* (1948), that achieved that rare distinction. These books were written at a time when American behaviorism was in ascendancy, and many psychological laboratories were converting to places for studying conditioning. Pavlov, Bechterev, Watson, and Thorndike had persuaded psychologists that the proper study of the mind was via behavior, and that behavior was largely to be understood by examining the learning history that gave rise to it.¹ Thus, theories of behavior were almost entirely theories about learning, laced with some additional ideas about how incentives and motives might operate to control the expression of what has been learned.

CONDITIONING AND LEARNING

Conditioning and Learning was exemplary in classifying and organizing critical concepts, data, and hypotheses regarding acquisition and extinction of conditioned responses, spontaneous recovery, generalization, and discrimination. Additional topics included the nature of reinforcement, along with specialized areas such as voluntary action, problem solving, social learning, personality influences on conditioning, and neurophysiological theories of conditioning. The text named and codified a number of useful distinctions that organized subsequent discussions. These included the names *classical* versus *instrumental* conditioning (replacing Skinner's *Type S*

versus *Type R* nomenclature) and the distinction between adaptation (or habituation) and interference views of extinction. The authors also summarized the growing literature on voluntary control of conditioned responses, which was to form part of the cognitivists' later critique of behavioral conditioning concepts (see Brewer, 1974).

Hilgard and Marquis also astutely classified psychologists' rather disparate perspectives with respect to the concept of conditioning. These perspectives included (a) conditioning as a substitute for the concept of association (Guthrie), (b) the conditioned response as a unit of habit (Watson), (c) conditioning experiments as representative of other forms of learning (Hunter, Symonds), (d) conditioning as a source of theoretical, deductive principles (Hull), and (e) conditioning as a subordinate and restricted form of learning (Tolman, Kohler). Notably, these perspectives still characterize different groups of modern behavioral scientists.

Conditioning and Learning contained not only a detailed and comprehensive summary of the facts of conditioning, but also a lively discussion of the controversies of the day, especially those between Tolman and gestalt psychologists, on the one hand, and Hull and his associates, on the other. The authors provided an accessible exposition of the intricacies of theoretical derivations, such as Hull's deduction of aspects of rats' "reasoning" behaviors from such concepts as the anticipatory goal response (r_g), the goal gradient, and the habit-family hierarchy. Undoubtedly, direct acquaintance with their Hullian Yale colleagues informed Hilgard and Marquis of the reasoning as well as the passion surrounding these debated issues. Nonetheless, after their detailed review, the authors were able to step back and direct some trenchant criticisms toward all parties to the debate about the nature of conditioning. Ever the pragmatists, Hilgard and Marquis lamented the failure of conditioning principles to illuminate substantially the nature of common human learning tasks, such as those occurring in school subjects. They called for more studies of human learning in ecologically valid settings (pp. 250–252)—a call that became far more urgent with the onset of World War II, as American psychologists were

asked to help improve military training methods.

Conditioning and Learning quickly became a citation classic and reference book in psychology. The text was never revised by the original authors: Hilgard channeled his writing skills into a second textbook, *Theories of Learning*, whereas Marquis moved into a vigorous career in social psychology. *Conditioning and Learning* was eventually revised and substantially updated 13 years later by Gregory Kimble. The original text was so respected and lionized that Kimble graciously included in the title the original authors' names, viz., *Hilgard and Marquis' Conditioning and Learning* (Kimble, 1961). Kimble's revision continued the tradition of being a widely used and cited textbook and reference work.

THEORIES OF LEARNING

Theories of Learning became the defining survey textbook for hundreds of teachers who organized their lectures around it. It also served as a prototype for later survey textbooks and courses in social, personality, and developmental psychology. This early text set forth the basic distinction between stimulus-response, behavioral, and gestalt or field theories of learning. Hilgard viewed these families of theories as differing on several basic issues, such as the causal power of a training history versus the contemporary field situation, the influence of memory versus perceptual interpretations in determining behavior, whether analysis of "whole" experiences into constituent elements captures or misses critical aspects of a psychological account, and whether to embrace or eschew mentalistic constructs such as images and ideas (in contrast to muscular reactions).

Hilgard viewed the latter contrasts as modern versions of the philosopher's ancient problem of whether (or how) we can know other people's minds. On the one side are the methodological behaviorists, who claim that it is impossible to know other people's minds, since we are limited to observing their objective behavior; on the other side are the mentalists, who claim that we know other minds by analogy and projection, attrib-

1. Full names and references for the theorists mentioned in this review can all be found in Hilgard (1948).

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uting to others psychological entities (thoughts, beliefs, desires, feelings) similar to our own.

The cognitive psychologists' arguments opposing extreme forms of stimulus-response behaviorism were already well summarized by Hilgard in this 1948 text, which was characterized by Hilgard's catholic scholasticism alongside his unprejudiced willingness to consider common sense and phenomenal experience as worthy sources of information about how humans operate.

Exposition and comparison of the major learning theories was aided by Hilgard's device of guessing how the theorists would answer a standard set of questions, such as these: What are the limits of learning? What is the role of practice? How important are motives and incentives in learning? What place is accorded to insight and understanding? Does learning one thing help us learn something else? What happens when we remember and when we forget? Throughout later editions of the book, these questions continued to serve as an organizing framework for comparing the different theories.

The first edition of *Theories of Learning* was organized primarily according to major psychologists whose names attached to their theoretical ideas or positions—Thorndike, Guthrie, Hull, Skinner, Lewin, Wheeler, and Tolman. The only "schools" of psychology that earned a chapter were functionalism, gestalt theory, and miscellaneous followers of field conceptions such as Lashley, Muenzinger, and Maier. This "big names" approach to the book's organization continued throughout later editions, with new chapters on Freud and Piaget added as those on Wheeler and Lewin were taken out because of lessening influence on learning researchers. Later editions (Hilgard & Bower, 1966, 1975) added chapters to cover new developments, such as theories of reinforcement and motivation, and special areas, such as mathematical models, information processing theories, theories of instruction, and the neurophysiology of learning.

As Hilgard's research interests turned increasingly to hypnosis rather than learning, starting with the third edition of *Theories of Learning* in 1966, he invited me to draft these chapters on new devel-

opments and help update the older chapters. Later editions (Hilgard & Bower, 1975; Bower & Hilgard, 1981) added new material to all the older chapters to demonstrate how the "big name" theories continued to address contemporary issues. Over successive editions, the text gradually expanded to nearly four times its original length as it became more comprehensive.

Theories of Learning became an immediate citation classic and standard reference work. Succeeding generations of psychologists studied it in countless courses and training programs. Every survey of "most recommended texts for psychology Ph.D. prelim exams" has found *Theories of Learning* (or its revisions) among the top two to five (Solso, 1979, 1987; Sundberg, 1960). However, with the gradual decline of interest in global theories of behavior, the landscape of psychology curricula has slowly changed so that learning theory is now taught increasingly as a subpart of more specialized courses, such as courses on conditioning and animal learning or human learning. Also, the cognitive revolution has shifted the focus of the curriculum in experimental psychology away from learning theory courses and more toward courses in cognitive psychology or human memory and cognition. Although there is clearly renewed interest in learning among cognitive scientists (Anderson, 1983, 1993; Singley & Anderson, 1989) and connectionists (Rumelhart & McClelland, 1986), the issues of greatest concern to participants in this resurgence are outside the focus of *Theories of Learning*.

HILGARD AS CRITIC AND SYNTHESIZER

Through his many textbooks and review chapters, Hilgard earned a well-deserved reputation as a person who could synthesize and synopsize major theories and findings in learning. However, in his autobiography (Hilgard, 1974), he wrote somewhat regretfully that his ability to compare and write sympathetically about conflicting theories led him to an eclecticism that may have prevented him from developing many original contributions of his own.

Hilgard's self-effacement may be

overdrawn, because even a casual perusal suggests that he did give voice to a number of very important ideas scattered throughout his writings on learning. For example, he suggested early on that stimulus-response concepts were too restrictive and probably should be replaced by cognitive concepts, and that an organism's behavior in a novel situation should be viewed as a problem-solving attempt (a "provisional try") rather than the running off of habits. He also effectively countered a popular view, held by many early comparative psychologists, that for a psychological process to be scientifically respectable it had to be demonstrated to occur in lower animals. On the contrary, Hilgard suggested (1948) that "only if a process demonstrable in human learning can also be demonstrated in lower animals is the comparative method useful in studying it" (p. 329). In short, the study of human experience is important in its own right regardless of whether animal models of particular phenomena can be found. Hilgard also warned against too rapid confinement of learning research to just a few laboratory paradigms such as eyeblink conditioning, rats in mazes and operant chambers, and rote memorization of nonsense syllables. He recommended instead that researchers return to more naturalistic observations of learning as it occurs in schools or in everyday life (Hilgard, 1948, p. 351). This was an early call for more "ecological validity" to the increasingly sterile laboratory studies of learning. It was a call that evoked a strong response from later researchers in military and industrial training contexts, in applied behavioral analysis, and in educational settings.

FINAL COMMENT

Rereading these eminent books renews one's appreciation of the considerable talents of Hilgard as a reviewer, synthesizer, arbiter, and organizer of vast bodies of psychological research. Here was a consummate scholar who was open-minded and had a great gift for sympathizing with and understanding a variety of theorists with conflicting viewpoints. He served as a reliable integrator and objective commentator throughout a scientific history filled with intellectual

battles and often rancorous debates. The entire field, and generations of psychologists, owes Hilgard a vote of thanks for his intellectual efforts. It was entirely fitting that he was voted a recipient of the American Psychological Association's Distinguished Scientific Contributions Award in 1967 and the American Psychological Foundation's Gold Medal Award for a Lifetime of Contributions to Psychology in 1978. We do indeed salute him with respect and affection . . . and with no little envy of his continuing intellectual and physical vitality into his 90th year!

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