

This Week's Citation Classic

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Harlow H F. The formation of learning sets. *Psychol. Rev.* 56:51-65, 1949.
[Univ. Wisconsin, Madison, WI]

The concept of learning sets was designed to show that the original learning on any problem or any kind of problem is a slow be-labored process. However, if many problems of a single type are done, the nature of the learning changes from trial and error to immediate insightful learning. [The Science Citation Index® (SCI®) and the Social Sciences Citation Index™ (SSCI™) indicate that this paper has been cited over 310 times since 1961.]

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"In the original research on learning sets we ran all of the problems for a predetermined number of trials. Six to be exact. The problem selected is that of object-quality discrimination learning. During the first 50-100 problems none of the subjects came close to mastering the test. However, as successive groups of 50 or 100 problems were presented, the nature of the learning changed and the percentage of correct responses on trial two rose from chance, i.e., 50% correct responses, to 60, 70, 80, 90, and

95% correct. In other words, the information given by trial one was all that was required to make perfect or almost perfect responses on trials two, three, four, five, or six.

"Conventional learning theory of the Hull-Spence type assumed that all learning was made on a trial and error basis. This contrasted with the Gestalt theory hypothesis that learning was achieved suddenly or insightfully or that it was an 'ah-hah' experience. Thus the behaviorist trial and error learning theory and the Gestalt insight learning theory were at total odds.

"The learning set theory studies were designed to show that there were no real discrepancies between the trial and error learning theory and the Gestalt learning theory. When an animal learns a new kind of problem, he solves it according to a behaviorist learning theory model by slow painful plodding trial and error. However, if he has experience with a large number of problems of a single type or class the trial and error is replaced by the Gestalt learning theory model so that the individual problems are eventually solved insight-fully.

"Thus trial and error learning theory and insight learning theory are merely two phases of a learning model, an initial phase and an ending phase.

"I believe my paper has been widely cited because learning sets describe the mechanisms by which complex learning problems are mastered by primate animals. After a time these problems are solved immediately or almost immediately."