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Proceedings of the Annual Meeting of the Cognitive Science Society

Title

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Journal

Author

St. John, Mark F.

Publication Date

1996

Peer reviewed

Computational Differences Between Implicit and Explicit Learning: Evidence From Learning Crypto-Grammars

Mark F. St. John
Department of Cognitive Science
University of California, San Diego
La Jolla, CA 92093

Abstract

If implicit learning is a form of memorization/prototyping, and explicit learning is a form of hypothesis testing, then they should differ both computationally and behaviorally. Experiments 1 and 2 found that implicit learning in an artificial grammar learning task was unable to learn nonadjacent regularities. Subjects read aloud 60 letter strings containing either adjacent or nonadjacent regularities. In a subsequent categorization task on novel rule-governed vs. rule-violating strings, subjects demonstrated learning of the adjacent rule only. A Simple Recurrent Network (SRN) can simulate subjects' implicit learning behavior whereas previous associative network models (e.g. Dienes, 1992) cannot. Experiment 3 compared implicit and explicit learning: instructions to read strings aloud vs. search for rules. The nonadjacent rule was only learned under explicit learning. A hint making the rule more salient enhanced explicit learning but not implicit learning. Finally, subjects can voluntarily switch strategies. In sum, implicit and explicit learning show different effects and different limitations, supporting the contention that they are indeed different strategies.

Reference

Dienes, Z. (1992). Connectionist and memory-array models of artifical grammar learning. Cognitive Science. 16. 41-80.