Mapping Individual Variations in Learning Capacity

Individual differences in learning capacity are evident in humans and most other animals. Traditionally, such differences are described in terms of variations along a relatively small number of psychological dimensions corresponding to behavioral traits. Here, an alternative approach is considered in which individual differences in learning capacity are characterized by spatially sorting behavioral patterns. To illustrate this approach, a two-dimensional, self-organizing, feature map was used to analyze patterns in the performances of intact and cortically-lesioned rats engaged in multiple learning tasks. After training, the spatial structure of the map revealed systematic variations in learning across rats that were related to the degree of brain damage. Individual nodes within the map described prototypical performance profiles that corresponded closely to patterns of learning seen in individual rats, including individuals with idiosyncratic profiles. Techniques that automatically identify modal patterns of performance during learning may provide new insights into the processes that determine what an individual organism can learn.