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Differential Effects of Top-Down and Bottom-Up Attention in Category Learning

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Abstract

The ability to selectively attend to diagnostic stimulus features plays a critical role in category learning. However, attention can be selectively allocated via different mechanisms: Top-Down and Bottom-Up attention. Although the two mechanisms have differential effects on multiple perceptual phenomena, their differential effects on category learning have not been established. To differentially examine the roles of Top-Down and Bottom-up attentional mechanisms in category learning, we conducted a study in which we varied the way in which attention to diagnostic features was allocated. Adult participants learned to categorize novel stimuli in one of four experimental conditions: Baseline, Top-Down, Bottom-Up, and Top-Down + Bottom-Up. Results indicate that Drawing attention to the D-feature via Top-Down and Bottom-Up attentional mechanisms leads to differential effects in category learning and generalization. Moreover, simultaneously engaging Top-Down and Bottom-Up attentional mechanisms during training leads to impaired category learning, suggesting that the mechanisms have opposing effect in learning.

Keywords: category learning; attention; top-down; bottom-up