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The C957T DRD2 Polymorphism Predicts Rule-Based Category Learning Performance

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Abstract: We assessed the role of the DRD2 dopaminergic striatal gene polymorphism on performance in unidimensional and conjunctive rule-based category learning tasks. The unidimensional task requires a rule along a single stimulus dimension, while the conjunctive rule task utilizes a combination of two dimensions to distinguish members of each category. The results show that DRD2 C957T T allele carriers outperformed CC homozygotes on both the unidimensional and conjunctive rule tasks. We also observed effects for two other dopaminergic genes. DARPP-32 AA homozygotes outperformed G allele carriers on both tasks, and COMT Met allele carriers outperformed Val homozygotes in the conjunctive rule task, but not in the unidimensional task. Our results suggest that while striatal dopamine binding might play a critical role in both types of rule-based tasks, prefrontal dopamine binding is important for performing well in more complex conjunctive rule tasks. We discuss implications for neurobiological models of category-learning.