

Decision Making in Agenesis of the Corpus Callosum: Computational Analysis of the Iowa Gambling Task

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Introduction: People with agenesis of the corpus callosum (ACC) have been shown to exhibit deficiencies in the domains of decision-making and complex novel problem-solving.

Nevertheless, the specific nature of the problems in cognitive functioning that contribute to these deficits are not clearly understood. This study used the Iowa Gambling Task (IGT) to test decision-making ability and complex novel problem-solving in ACC.

Method: Thirty-four individuals with complete or partial ACC (age 11-62; FSIQ 78-129) were compared to 19 controls (age 18-51; FSIQ 85-111) on the IGT. A trial-by-trial computational analysis called the expectancy-valence (EV) model (Busemeyer & Stout, 2002) was applied to the results of the IGT to elucidate specific differences in cognitive strategies utilized by the groups.

Results: The ACC and control groups did not differ significantly in overall performance on the IGT, or on the learning or choice consistency values of the EV model. However, the ACC group exhibited significantly higher attention to losses on the motivation parameter ($p < .05$; ACC $M = .62$, Control $M = .38$).

Discussion: Participants with ACC performed similarly to control participants overall on the IGT, and thus the issues with decision-making are not like those seen in persons with frontal lobe disorder. However, the EV model reveals that participants with ACC are more influenced by losses than controls. Further research involving other decision contexts is needed to ascertain the specific contribution of loss aversion to decision-making and complex-novel problem-solving deficits in people with ACC.

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