A TWO-LAYERED DIFFUSION MODEL TRACES THE DYNAMICS OF INFORMATION PROCESSING IN THE VALUATION-AND-CHOICE CIRCUIT OF DECISION-MAKING.

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ABSTRACT
In this study the circuit of valuation and choice of a decisional process during Two-Alternative Forced-Choice (TAFC) task is presented in terms of a two-layered network of computational cells, where the dynamics of information accrual and processing progresses in a diffusion mode. Diffusion models are naturally appropriate for describing phenomena characterized by the accumulation of evidence over the time. The evolution of the response-to-stimulus map is thus modeled by two linked diffusive modules (2LDM) representing the neuronal populations involved in the valuation-and-decision circuit of decision making. The response times in the accumulation process are supposed distributing as an ex-Wald variable. A logistic transfer function integrates the activities of the information processing modules. The neurobiological background and the Bayesian perspective of the model is also provided.