Using the Contingency Discrimination Model to predict changes in saccade latency distributions in a concurrent reinforcement procedure

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Résumé

Vullings & Madelain (2018) used a concurrent random-interval reinforcement schedules in which the probabilities of reinforcing short and long saccade latencies were manipulated. They found that latencies changed following the generalized matching law (Baum, 1973) as the relative frequencies of short and long latencies matched the relative frequencies of reinforcement. These results established that reinforcer contingencies affect the allocation of saccades in time. Here we adapted the Davison's Contingency Discrimination Model (Davison & Cowie, 2022), which postulates that a reinforcer is an event that signals the contingencies in force, to account for the observed changes in saccade latency distributions. A central aspect of Davison's approach is that choices should follow the discriminated rather than the actual availability of reinforcers so that future behavior depends on the generalization across the spatial and temporal properties of these events. Using the reinforced saccade latency distributions (about 20% of all trials) we were able to adequately account for the distributions of unreinforced saccade latencies (about 80% of all trials). Because saccades generate information about the state of the world, i.e. the actual reinforcement contingencies, past saccades may control future saccades by signalling which might produce appetitive, or more generally fitness-enhancing, events and which might produce aversive, or fitness-reducing, events.

Mots-Clés: Saccade latency, Choice, Reinforcement, Model

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