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Choice behaviour: Short- and long-term effects of reinforcers

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ABSTRACT

Behaviour was analysed at a number of levels in two series of concurrent-schedule experiments. In the first, six or seven concurrent-schedule components, each of which could have a different reinforcer ratio in it, were arranged in each session. In the canonical arrangement these components were separated by 10-s blackouts. Across conditions, the reinforcer ratios arranged in components were varied. The overall rate of reinforcement was constant throughout, and each condition was in effect for 50 sessions. The second series of experiments used a conventional switching-key concurrent-schedule procedure in which a single reinforcer (or reinforcer-magnitude) ratio was in effect for 65 sessions.

Experiment 1 showed that behaviour adjusted very quickly to the rapidly changing contingencies. Sensitivity to reinforcement reached higher levels when the range of reinforcer ratios arranged was greater. More detailed analyses suggested that the variables controlling behaviour operated at a number of levels. First, each individual reinforcer had an effect on subsequent behaviour. Second, successive reinforcers obtained at the same alternative ("confirmations") had cumulative effects that were evident when behaviour was examined as a function of time since reinforcement (i.e., the change in behaviour after the third successive confirmation at the left alternative was greater than that after the second). Third, when these sequences of confirmations occurred more frequently, their behavioural effects were again increased. Finally, "disconfirmations" (a reinforcer obtained from the other alternative following a sequence of confirmations) had comparatively very large effects, and returned preference to levels controlled by the molar or sessional reinforcer ratio.
Experiment 2 showed that the local effects of reinforcers evident in Experiment 1 were also present in steady-state data. Effects of individual reinforcers on behaviour were evident, as were longer-term effects of aggregations of reinforcers. Preferences were again more extreme in response to sequences of confirmations when those sequences occurred more frequently. Similarly, disconfirmations had comparatively very large effects, and returned behaviour to levels controlled by the molar reinforcer ratio. Moreover, these local effects of reinforcers were similar when either the reinforcer-frequency ratio or the reinforcer-magnitude ratios were varied.

The present data question the commonly held assumption that behaviour is controlled by large aggregations of reinforcers. Control was evident at a number of levels, and attempts to model concurrent-schedule data are likely to require processes operating at multiple levels. The present data also suggest that the frequency with which sequences of confirming reinforcers occurred was central, and longer-term processes might be updated with the delivery of a disconfirmation. Moreover, different concurrent-schedule arrangements might result in these frequencies differing substantially with the same reinforcer ratio arranged. An increased focus on detailed data collection using relatively standard manipulations of reinforcer frequency, magnitude, and other independent variables that are known to affect choice, is recommended.
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