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EVENT-BASED O-RULES AND COST: REPLY TO BAUM

REGLAS-O BASADAS EN EVENTOS Y COSTO: RÉPLICA A BAUM

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In my paper on reinforcement and feedback (this issue), I argue that a prominent view of O-rules, taken from Baum (1973), is at odds with the standard concept of operant reinforcement. The problem with the kind of O-rule proposed by Baum (1973) is that it is *event-based*: that is, it expresses operant behavior as a function of its consequences. This sort of O-rule cannot distinguish reinforcement from elicitation by the putative reinforcer. In contrast, the O-rule appropriate to a reinforcement process should be *relation-based*: it should express reinforced behavior as a function of its *relation* to its consequences.

It is important to realize that my paper is not about empirical issues, such as whether the O-rules that actually control behavior are event-based or relation-based, or whether the rate of a particular response decreases or not under a yoked control procedure. Rather, in this paper I explore a conceptual issue: delineating the sort of O-rule that could embody what behavior analysts normally mean by "reinforcement" (what they mean when they allude to the *reinforcing* role of consequences). Once this conceptual issue is settled, of course, plenty of empirical issues remain. But having a clear view of the former could promote a better grasp of the latter, especially if they are complicated—which they are.

In his reply, Baum (this issue) agrees that his 1973 version of the O-rule represents induction/elicitation by the reinforcer instead of reinforcement. Nevertheless, he argues that a relation-based O-rule fails.

Baum first suggests that the input of a relation-based O-rule consists of possibilities (namely, possible relations between B and E), whereas behavior depends on actual states of affairs. Interpreted in a similar fashion, however,

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the input of an event-based O-rule would *also* consists of possibilities (namely, possible stimulus rates). In either case, interpreting the input of an O-rule as a set of possibilities is incorrect, as Baum himself realizes ("Tonneau probably meant to include the actual correlation between responding and consequences in the O-rule"). Be it event- or relation-based, the O-rule formalism is employed to cover all possible states of affairs (as in my Figure 1), but what matters in any particular situation is the subset of the former that actually occur.

Baum also suspects that a relation-based O-rule will prove tautological. As I pointed out, however, the hypothesis that reinforced behavior is a function of its own relation to the environment has been explored by Baum himself, if only tentatively, in his explanation of delay-of-reinforcement effects (1973, p. 141, pp. 145-146). Whatever the empirical fate of Baum's correlation-based explanation (1973), it is certainly not tautological.

Finally, Baum suggests that incorporating response cost can explain the difference of results between closed-loop schedules and yoked control procedures even with an event-based O-rule. As far as conceptual issues are concerned, the point I made about event-based O-rules remains valid irrespectively of the role of cost. Adding cost whenever a response is evoked by a previous consequence still doesn't bring any operant reinforcement process into the picture. The response may be inhibited by its cost but is still excited, not *reinforced*, by environmental stimuli. In the case of the donkey walking backward (B) whenever a stick is applied to its nose (E), doesn't walking have a cost?

As far as empirical issues are concerned (that is, predicting response rates under closed-loop and yoked procedures), Baum's explanation in terms of cost does assume a reinforcement process (notice that Baum speaks of indicators as selecting, not evoking, a particular rate); yet Baum and I agree that the 1973 O-rules do not describe reinforcement. So I suspect that an operant model with added cost makes the expected predictions because it appeals to relation-based O-rules or some formal equivalent to them, such as using E, B pairs as a source of feedback. (If I am correct about this, then it was a mistake of mine to mention the 1981 article as exemplifying the same feedback system as that described in 1973 and 1989). Thus, as Baum himself emphasizes, the nature of the relation between induction and reinforcement remains far from clear.

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