Comments on the Learn Unit

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Greer and McDonough (1999) is an excellent article, a contribution to our field. Of course, I have a few concerns. In order of importance: (a) I think much of the teacher's behavior is under the control of rule-governed analogues to direct-acting behavioral contingencies, and behavior analysts need to stay focused on the crucial distinction between analogues and direct-acting contingencies; (b) I think the teacher's behavior should be analyzed separately from the student's by not including the teacher's contingency within the student's learn unit (contingency).

The Teacher's Contingency

I agree that, at least under optimal conditions, the teacher can learn to teach, just like the researcher learns to research, but in neither case do I think their learning is like the rat's learning or the nonverbal autistic child's learning. Because of the small and cumulative nature of the response outcomes, teacher and researcher learning often results only from a careful verbal analysis of the data accumulated across a number of learn units. That is why behavior analysts argue for daily graphing of results, so the teacher or researcher can see the gradual accumulation of changes or the lack thereof.

For example, the incremental effect of a single instance of reinforcing the child's behavior is usually too small to have any appreciable effect on the behavior of that child; the initial teaching of match to sample may take quite a few learn units. If changes in the child's behavior are critical consequences for the teacher's behavior, then

this interaction involves extinction for the teacher. Behavior analysts, however, give the teacher a rule: Keep trying, and eventually the child will match to sample accurately. Furthermore, we ask the teacher to plot the results, so he or she can see the child's gradual progress and take heart.

Suppose the teacher were the recipient of direct-acting contingencies of reinforcement involving immediate, sizable improvements in the student's performance. Then behavior analysts would be more or less out of business, because the natural contingencies would teach teachers and they would only need our help for a few initial pointers (more or less the naive philosophy behind most early attempts at behavioral teacher training via weekend workshops). Unfortunately, the natural contingencies in the classroom, as in much of life, support inappropriate behavior rather than behavior that is effective in the gradually evolving long run. For example, show me the natural contingencies that will support the teacher's or parent's extinction of the child's tantrum behavior. Instead the immediate results of such a learn unit will probably be a little aversive and thus punishing for the teacher or parent. Yet, the teacher or parent may follow the rule that if they are consistent in their efforts, the undesirable behavior will decrease (they may follow the rule, at least when the behavior analyst is looking). There is nothing natural or automatic about the practice of behavior modification.

Here is a similar problem: Suppose the teacher delivers a reinforcer to the student immediately after the student's correct response. The student might smile and eat the edible item, but the student's joy is not the reinforcer we want to control the teacher's behavior,

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because joy would also occur if the teacher gave the edible item immediately after an incorrect response. The outcome that should control the teacher's behavior is the delayed, gradual improvement in the student's behavior that will take place across a large number of learn units. In general, behavior analysts need to diligently maintain the distinction between the student's direct-acting contingencies of reinforcement and the teacher's rule-governed, indirect-acting verbal analogues to reinforcement contingencies.

Of course, students are often verbal, and in that case their learning may be of the same complex rule-governed nature as the teacher's. However, such learning is as apt to be mistaken for contingency-governed learning. For example, consider the delayed delivery of feedback, as in the Hogin (1996) and the Albers and Greer (1991) studies (both cited in Greer & McDonough, 1999). This involves complex learning of verbal rules and when to apply them. The students may be learning to say to themselves something like, "With this kind of problem, I need to make this kind of response and not the kind of response I was making, in order to solve the problem and make my teacher happy." You would not dream of giving feedback delayed several minutes, hours, or days with nonverbal kids, nor would you even be able to start doing so.

This analysis does not imply that all learning by verbal human beings is rule governed. Direct-acting contingencies are also always controlling our behavior and are even lurking in the background supporting rule control as well. We do not need the rule: If your nose itches, scratch it.

The Learn Unit

I have always found it awkward to include the teacher's contingencies with the student's in a single dyadic learn unit. Indeed, most of the discussion by Greer and McDonough (1999) addresses only the student's continen-

cies, with the teacher's contingencies gratuitously hanging on. I am inclined to talk about *learn units for the student* and *learn units for the teacher*, emphasizing that both are important. The student's learn unit will produce learning for the student, on the single trial in which it is applied, even if there were no learn unit for the teacher. True, it is also important to have learn units for the teacher, so the teacher can become a better teacher, but that is a separate, though related, problem. Also, distinguishing between the two types of learn units might slightly reduce the tendency to treat the teacher's rule-governed verbal analogue contingencies as if they were just like the student's direct-acting nonverbal contingencies.

Conclusion

My major concern is that contingencies with delayed outcomes and contingencies with small but cumulatively significant outcomes are treated differently from the direct-acting contingencies with which behavior analysis traditionally has dealt (cf. Malott, 1989, 1993). Also, I think it would be better to talk about separate but interacting learn units, one for the student and one for the teacher. However, I am in complete agreement with calling contingencies learn units in the educational setting, whether we are talking about autistic children and their teachers or graduate students and their teachers. In all cases, I have found "we must increase the frequency of learn units" to be a useful battle cry, one that helps us to stay focused on our educational mission and on effective strategies for accomplishing that mission.

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