A Reply to Behavior Analysts Writing About Rules and Rule-Governed Behavior

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Verbal stimuli called "rules" or "instructions" continue to be interpreted as discriminative stimuli despite recent arguments against this practice. Instead, it might more fruitful for behavior analysts to focus on "contingency-specifying stimuli" which are function-altering. Moreover, rather than having a special term, "rule," for verbal stimuli whose only function is discriminative, perhaps behavior analysts should reserve the term, if at all, only for these function-altering contingency-specifying stimuli.

In two recent articles in *The Behavior Analyst*, a colleague and I (a) described the function-altering effects of some contingency-specifying stimuli (CSSs), namely their ability to alter the respondent and operant function(s) of the stimuli they describe (Schlinger & Blakely, 1987), and (b) suggested that if behavior analysts continue to use the term "rule" at all, then perhaps they should restrict it to these function-altering effects rather than using the term for verbal stimuli with only discriminative effects (Blakely & Schlinger, 1987). Why, we argued, have a special term for a verbal discriminative stimulus if its function is no different than that of a nonverbal discriminative stimulus? This suggestion challenged the prevailing consensus in behavior analysis initiated by Skinner (1966) about the function of verbal stimuli called rules, namely, that they are discriminative stimuli.

Since then, the discussion of rules as discriminative stimuli has continued unabated in the behavioral literature (e.g., Catania, 1989; Cerutti, 1989; Glenn, 1989; Malott, 1988). In a recent paper in this jour-

nal, Glenn (1987) argued that behavior analysts should embrace a formal definition of rules. Catania (1989) then replied to Glenn's article and Glenn (1989) replied to Catania's reply. Throughout this debate, both authors proceeded according to the assumption that a rule does or can function as a discriminative stimulus. In a recent theoretical paper in the *Journal of the Experimental Analysis of Behavior*, Cerutti (1989) argued that rule-governed behavior is complex discriminated behavior. I would like to suggest that continued adherence to the rules-as-discriminative stimuli interpretation may be one cause of the confusion over how we should interpret verbal stimuli that we call rules, that is, what controlling variables, if any, should evoke the term "rule." Therefore, in this paper I would like to restate the main points made by Schlinger and Blakely (1987), and Blakely and Schlinger (1987), but in the context of addressing some of the recent non-empirical work on rule-governed behavior.

Perhaps the best place to begin is at the heart of the matter, the definition of "rule." First, however, I should like to point out that I am not suggesting that "rule" is or should be a technical term in behavior analysis, only that if the term continues to be used, that it be defined functionally, and that it not be a synonym for verbal discriminative stimuli. In attempting to

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answer the question, then, of how we should define rule, we should take a lesson from Skinner and look at some of the different ways the term is currently used. Only then can we identify possible inconsistencies in what the verbal community permits and suggest ways to tighten the stimulus control.

In an attempt to avoid the potential tautology involved in the term "rule-governed behavior," Glenn (1987) suggested that we define rules as environmental events, like red lights, "without respect to the responses that may or may not be controlled by them." In a reply, Catania (1989) admonished Glenn for imposing a formal definition on a behavioral event that should be defined functionally like other behavioral events such as reinforcer and discriminative stimulus. Apparently one of Glenn's concerns was that a descriptive term (rule-governed behavior) may be used as an explicandum. If the name for a functional relation is used as the explanation of the observed effect then Glenn would be correct in cautioning us. For example, if we state to a child, "Come back in when you hear the school bell," and then attempt to say that the child went back in when the bell rang because the behavior was rule-governed, then it would indeed be a logical error. The solution, however, is to clarify the distinction between using a term descriptively rather than as an explanation (e.g., Epstein, 1982, p. 4), not to define functional relations without regard to function as Glenn apparently suggested. Of course, with respect to rules, the question of function lies at the heart of the definitional quandary in which we find ourselves.

Most other behavior analysts do talk about rules functionally (e.g., Catania, 1989; Cerutti, 1989; Hayes, Thompson, & Hayes, 1989; Blakely & Schlinger, 1987), but not all are in agreement as to the specific function. According to Catania (1989) the "current working definition of rule-governed behavior is that it is behavior under the control of verbal antecedents." Before agreeing with Glenn (1989) that this is far too inclusive, let me attempt a clarifi-

cation. The word control is a slippery one and is itself multiply determined. When we speak of reinforcement control and discriminative control we are talking about two different types of control (Michael, 1983). Catania was presumably alluding to discriminative control, as this is usually equivalent to operant antecedent control in the behavioral literature. Hence, it seems that Catania was defining rule-governed behavior, if I may paraphrase, as behavior under verbal discriminative control (see also Catania, 1984, p. 238). The other type of operant antecedent control that we know of is motivational (see Michael, 1982), but only a few behavior analysts ascribe this type of control to rules (e.g., Malott, 1988). But Catania is not alone in considering rules to be discriminative stimuli (see Baldwin & Baldwin, 1981; Cerutti, 1989; Galizio, 1979; Skinner, 1969).

Thus, it might be instructive to look at a "working definition" of discriminative stimulus. According to Catania (1984),

Responses can be differentially reinforced not only with respect to response dimensions but also with respect to the dimensions of *stimuli in the presence of which responses occur*. For example, a rat's lever presses *in light* are different from its presses in darkness, and reinforcement can be arranged for lever presses *in the presence* but not the absence of light. (p. 127, italics added)

The "stimuli in the presence of which responses occur" are called discriminative stimuli. Such stimuli are said to "occasion" responses (Catania, 1984) or to evoke responses (Michael, 1983). In either case, we generally refer to "an immediate but momentary change in behavior" (Michael, 1983) due to a special history of differential reinforcement. Unfortunately, behavior analysts frequently offer examples of "rules" that do not occasion or evoke the behavior they describe, and the relevant history must be assumed post hoc. Moreover, in some cases, it is suggested that "rules" should be considered as discriminative stimuli even when they explicitly do not occasion the behavior they describe. For example, Cerutti (1989) writes that

responding in instructed discrimination may be occasioned by discriminative stimuli that are temporally and situationally removed from the circumstances under which the discrimination is instructed. (p. 259)

This is not how behavior analysts typically talk about discriminated responding in nonhumans. In the nonhuman laboratory, discriminative stimuli are not temporally or situationally removed from the behavior which they occasion: The rat presses the lever in the presence of but not the absence of the light. So what happens when we talk about rules as discriminative stimuli for human behavior?

Cerutti (1989) offers several examples of instructed discriminations which illustrate the problems. In one example a child is instructed to cross the street only when accompanied by an adult. But what if the parent states the street-crossing instruction in the morning and then in the afternoon when the child finds herself about to cross the street, she seeks the parent to accompany her? Should we talk about this as discriminated responding? Is it appropriate to say that the instruction in the morning occasions the behavior in the afternoon? In another example, a driver is told to "step on the brake pedal and come to a stop at a red light." If the red light is within sight then we could possibly invoke a discrimination interpretation of the statement, perhaps as part of a conditional discrimination. But what if there is no red light present? And then at some later time, the driver steps on the brake pedal and stops at a red light. Was the earlier instruction for stepping on the brake pedal the discriminative stimulus for the behavior or is it the sight of the red light? It seems obvious that the red light, not the statement, evokes or occasions the behavior. But due to what history? And there's the rub. The red light has acquired discriminative stimulus-like evocative functions as a result of the statement, "Step on the brake pedal and come to a stop at a red light." The statement has somehow altered the future function of the red light to evoke the behavior of stepping on the brake pedal, much in the same way that direct differential reinforcement for the behavior only in

the presence of the red light could have done. We have called this a function-altering effect (Schlinger & Blakely, 1987). Both differential reinforcement and the statement can alter the function of the red light to occasion behavior. Other behavior analysts have also alluded to function-altering effects (e.g., Cerutti, 1989, p. 262; Skinner, 1957, pp. 357-367; Vaughan, 1987). But Cerutti (1989) has gone one step further and interpreted this type of effect in the context of discrimination theory and called it "instructional discrimination." This interpretation may seem to work fine for statements that engender discriminative stimulus-like functions, but what about statements that endow previously neutral stimuli with reinforcing or (respondent) eliciting functions (see Schlinger & Blakely, 1987)? A discrimination interpretation does not fare as well. But it is not for this reason alone that we challenged the interpretation of rules as discriminative stimuli.

The interpretation of complex behavior is a difficult assignment. As behavior analysts we must undertake the task with the basic principles of our science as tools (e.g., Cerutti, 1989; Palmer, 1990; Skinner, 1957). Therefore, it may seem contradictory to suggest that a discrimination interpretation of the effects of some verbal stimuli may hinder rather than help our understanding. This brings me to a second reason why we questioned the classification of rules as discriminative stimuli: In many cases, especially where human behavior is at issue, the use of the term "discriminative stimulus" does not appear to be consistent with its use in the basic animal literature. If this is true, then we are not really using the basic principles to interpret complex behavior, but rather modifying them in an ad hoc fashion, without empirical support. The use of the term "discriminative stimulus" to describe the effect that an instruction given today has on behavior seen tomorrow seems to defy the usual conditions that lead us to call some event a discriminative stimulus. Not only is the occasioning or evocative effect missing, but we must assume post hoc the history of differential reinforcement that we all agree

establishes discriminative control. To simply call an instruction a discriminative stimulus because it precedes the behavior that it seems to be functionally related to is as much a formal interpretation as Glenn's (1987) conception of rule-governed behavior.

In light of the above discussion I would like to make some specific comments on points made by Catania (1989), Glenn (1989) and Cerutti (1989). As mentioned above, Catania (1989) defines rules broadly as "behavior under the control of verbal antecedents." Glenn (1989) in her reply points out that this definition includes potentially many different types of controlling relations and that we might not want to call all of them "rule-governed." However, elsewhere, Catania (1984), not to mention Skinner (1969) and others (e.g., Cerutti, 1989), does refer to otherwise simple commands as rules or instructions. In these cases it is probably not incorrect to posit discriminative control (or in some cases, perhaps motivational control). Simple commands such as, "Stand up" or the conditional, "Pick up the fork," occasion or evoke behavior probably because of a history of differential reinforcement which is not too difficult to imagine. These examples, however, seem different from the statement, "When the timer goes off, put your pencil down." Although statements such as this are also conditional, the distinction between them and simple commands is a subtle but important one. What occasions putting the pencil down is the timer, not the statement. How the statement establishes this function of the timer is presently unknown but it should be the object of empirical inquiry.

This brings me to another point, namely the requirements for a statement to produce function-altering effects. As has been argued elsewhere, certain formal properties of statements called rules (i.e., contingency-specifying stimuli) seem to be necessary (though not sufficient) to produce function-altering effects (Schlinger & Blakely, 1987). Specifically, the rule must describe at least two events from the following: (antecedent) stimuli, responses,

and consequences. Of course the rule can specify only stimuli. For example, in *Verbal Behavior* (1957, p. 357) (before he formally described rule-governed behavior), Skinner provided an example of what he called "conditioning the behavior of the listener," in which a subject is told, "When you hear a bell, you will feel a shock." Presumably the effect of such a statement is to endow the sound of the bell with eliciting properties (e.g., increased heart rate) similar to that of the shock even though the subject never experiences the shock. In this example, a relationship between two stimuli is described. I must, therefore, disagree with Catania (1989) about the necessity of some formal properties of rules. With CSSs, the formal properties do not "distract" us, rather they seem to aid us in identifying subtle but important functions. In the same way that certain formal features are necessary for the training procedures that generate transfer of stimulus functions such as stimulus equivalence (see Sidman & Tailby, 1982), or (classically) conditioned meaning (see Staats & Staats, 1957), it appears that verbal stimuli must include the events that are to be related if they are to be function altering. This is what we usually mean when we say that a statement "specifies" a contingency. In fact, we are never entirely free from some formal properties of functional relations, as when we say that reinforcers "follow" and discriminative stimuli "precede" behavior.

Now what about terminology? As I indicated at the beginning of this paper, "rules" are what we call them. It turns out that most behavior analysts use the term "rules" functionally; and the function usually ascribed to them is a discriminative one. Let us approach the problem of defining rules (i.e., how we use the term) in a logical progression. First, there is probably agreement that the stimuli in question are verbal, notwithstanding the debate by Catania (1989) and Glenn (1989) about which stimuli are to be called verbal. Secondly, there is probably no disagreement among behavior analysts that these particular verbal stimuli precede the behavior or relations they affect (a formal

characteristic). But the widespread agreement probably stops there. Thus, the remaining question seems to be to what function(s) of antecedent verbal stimuli do we reserve for the term "rule"?

In a previous paper (Blakely & Schlinger, 1987), we argued that if the only function of antecedent verbal stimuli is discriminative, then a special term seems unnecessary. Why call a verbal discriminative stimulus a rule and a nonverbal discriminative stimulus simply a discriminative stimulus? Glenn (1989) urges us to be parsimonious and not to treat verbal and nonverbal stimulus functions differently. I would specifically urge the same parsimony in using the term "discriminative stimulus." Behavior analysts should expect that the variables controlling the term are consistent across time and place. If some antecedent verbal stimuli have different functions than discriminative ones, then let us try to describe them and to study them experimentally and then, if it is important to distinguish them, to offer a different terminology. Consequently, after looking carefully at antecedent verbal stimuli called "rules" or "instructions," we noted that some antecedent verbal stimuli seem to function differently than discriminative stimuli. Moreover, these verbal stimuli always have the form of statements that specify a relation (or relations) between two or more events. Hence, we adopted Skinner's (1966) term "contingency-specifying stimulus" as descriptive of these antecedent verbal stimuli. Other antecedent verbal stimuli are not contingency-specifying, for example, those that specify only behavior, and do not seem to function any differently than discriminative stimuli (or motivational operations). Therefore, we saw no reason to call them by any special name, although lay terminology such as "command," or "request," seems harmless.

Finally, what is this different function that these CSSs seem to have? As I have already said, they apparently alter the function(s) of the events they describe just as if the listener had been exposed to actual respondent or operant contingencies. And, moreover, it seems that any stimulus func-

tion that can be altered by an environmental contingency can be altered by a CSS (see Schlinger & Blakely, 1987 for a list of some of the possibilities). But, discriminative stimuli do not produce such effects! Therefore, we suggested that if behavior analysts retain the term "rule," then they might consider reserving it for these special "function-altering" CSSs; not as an explanatory term but as a descriptive one. Discovering how such CSSs acquire their function-altering effects awaits an experimental analysis.

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