

own verbal behavior in order to learn verbal relations. There is not space to describe this alternative here, but this perspective also starts with the interpretation provided by Skinner (1957). It is extended with modern interpretations of how conditional discrimination and rule governance explain some critical aspects of verbal behavior (e.g., Cerutti, 1989; Chase, 1986; Hall & Chase, 1991; Hayes, 1991; Sidman, 1986). These interpretations are supported with experimental literature that shows the functional independence of many verbal repertoires as well as how some of these repertoires become connected (e.g., Chase & Imam, 1987; Chase, Johnson, & Sulzer-Azaroff, 1985; Ellenwood & Chase, 1992; Hall & Sundberg, 1987; Imam & Chase, 1988; Lamarre & Holland, 1985; Lazar, 1977; Lee, 1981; Lipkens, Hayes, & Hayes, 1993). This alternative suggests that responding to names and responding to objects can be developed separately and then induced by environments that require a new contingency. If Horne and Lowe leave out the self-listening components of echoing and naming and focus on the contingencies that select responding to object-name relations, name-object relations, and bidirectional relations among names and objects, then an account of verbal behavior is possible without

an interpretation of self-listening as a causal variable.

Conclusion

Ayer (1984) predicted that the current period of intellectual history would be marked by discussions of the kinds of evidence scientists adopt for accepting new knowledge. Horne and Lowe's theory of naming contributes to discussions among behavior analysts about levels of evidence. What kinds of evidence will behavior analysts use to incorporate new variables into behavioral theory? Can behavior, which cannot be manipulated independently, be described as a causal variable? If behaviorists do not accept behavior as a causal variable, will they accept interpretations of behavior functioning like environmental events that have been experimentally manipulated? What criteria are used to evaluate the usefulness of such interpretation? Horne and Lowe's interpretation of naming relies on the role of self-listening. I have tried to show that the usefulness of this interpretation is limited by not specifying the contingencies. I predict that when the contingencies are spelled out through careful experimentation, behavior analysts will see that self-listening is part of the topography of verbal behavior, but is not required in a functional account of verbal behavior.

SEPARATE REPERTOIRES OR NAMING?

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By adding listener behavior to some of Skinner's elementary verbal relations, Horne and Lowe are able to propose the concept of

naming as a higher order behavioral unit (p. 185). Naming is then used to interpret symbolic behavior and findings in the area of stimulus equivalence. Their analysis of equivalence research in terms of listener behavior, the tact relation, echoic and self-echoic behavior, and conditioned perceptual effects is, for me, a plausible and attractive alternative

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to Sidman's interpretation of equivalence as a basic behavioral process, and the contextualist-Kantorian language of Hayes and Hayes. Their higher order unit, however, seems less accurate than an analysis in terms of the repertoires supposedly composing the higher unit. I will illustrate this point with a detailed consideration of listener behavior, and with an alternative to one of their descriptions of the function of naming as a higher unit.

Horne and Lowe provide a valuable treatment of the importance of listener behavior in the development of language skills. Skinner (1957, p. 34) considered most listener behavior to differ little from other behavior controlled by nonverbal variables, thus not requiring the special treatment that he gave to the behavior of the speaker. Horne and Lowe, on the other hand, "consider the learning of listener behavior to be a crucial precursor to the development of linguistic behavior" (p. 192), a point they support with persuasive argument and relevant empirical findings.

The problem with their further use of the term *listener behavior* is the implication that it is a relatively uniform process. I see, instead, at least three fairly common types of operant listener behavior, as well as a possible respondent form; all with different histories, controlled by different variables, seldom all in effect at the same time, and therefore best considered to be independent repertoires that sometimes occur together.

First, the earliest learned listener behavior is what could be called a *generalized locating repertoire*. It is evoked by the verbal stimuli resulting from the tacts and mands of caregivers. Given the proper history, the caregiver's "Where's shoe?" (or just "shoe?" with the mand implication carried by tone of voice, eye contact, etc.) constitutes a learned motive variable (Michael, 1993), which makes the sight of the relevant object effective as a form of reinforcement and evokes the type of behavior that has been followed by that reinforcement, namely visual search behavior. If found, the sight of the object then functions as reinforcement for the search behavior and as a discriminative stimulus for pointing at it, touching it, or looking at it in some conspicuous way; this behavior is then reinforced by the caregiver's social approval (Horne &

Lowe, pp. 193–194, and throughout). They do not actually go into this much detail, but refer to the behavior simply as looking at or pointing to the objects named by a caregiver. Generalized locating might well be considered a ubiquitous and relatively uniform component of a child's social behavior. (The later addition of echoic and self-echoic behavior will be described below.)

Second, a child also learns more specific behavior in compliance with mands such as "bring me," "give me," "pick up," "put down," and so forth, which can apply to many objects (Horne & Lowe, p. 193). Unlike the generalized locating repertoire, this type of listener behavior is highly specific to the particular mand.

Third, the child also acquires some object-specific behavior (Horne & Lowe, p. 194) such as pushing a toy car, putting a foot into a shoe, pouring liquid from a pitcher, drinking from a cup, and so forth. Some of these kinds of behavior may be initially developed in relation to language instruction by caregivers, and may be evoked by the caregiver's tact (and implied mand) related to the object, but referring to them solely as listener behavior seems to neglect the role of the objects themselves as controlling stimuli and the nonsocial reinforcement arising from the interaction with such objects.

To this collection of operant relations one should probably add, as Horne and Lowe do (pp. 194 and 199), the respondent processes that Skinner (1953, pp. 266–270) referred to as conditioned seeing, although the universality of this behavior and even its occurrence are difficult to verify.

Only the first of these repertoires seems to me to justify their general use of the term *listener behavior*. Reference to the others when needed is not inappropriate, but not as though all four functioned together as a single behavioral unit. Using listener behavior to refer to any or all of these separate repertoires seems to substitute a vague general term where several more specific ones would be more accurate, and a similar point will be made below about the concept of naming as a higher order unit.

In developing the naming concept, Horne and Lowe make a number of important, and for me uncontroversial, points about the acquisition of verbal behavior. For example, tact

learning follows the learning of some relevant listener behavior; in tact training, the proper response form is typically evoked first as an echoic response; echoic and self-echoic behavior continues to accompany other verbal relations such as the tact, intraverbal, and mand; the various elementary verbal repertoires usually occur in combination with some form of listener behavior and with other elementary repertoires.

These and other aspects of language learning lead Horne and Lowe to define naming as "a higher order bidirectional behavioral relation that combines conventional speaker behavior and listener functions so that the presence of either one presupposes the other" (p. 207). When such naming skills have been taught, it is proposed that caregivers can teach conventional listening behavior (the basic locating repertoire) with respect to an object in response to "where's X?" and the tact relation will be in effect without further training. Or, when a tact relation is taught, the conventional listener behavior (locating in response to "where's X?") will be already available.

Without appealing to naming as a higher order relation, one could propose that when a child with an extensive echoic repertoire is taught to locate a new object, she may well make an echoic response when she hears the caregiver say "X," and because she will be looking at the object at the moment when correct locating behavior is reinforced, that reinforcement may also bring the echoic response form under the control of the nonverbal stimulus of the object, the tact relation.

To explain the appearance of the locating type of listener behavior as a result of tact training without a higher order naming concept, it is only necessary to appeal to the more sophisticated locating repertoire that develops as the area to be visually searched becomes larger or more complex. Under

such circumstances one would expect the occurrence of echoic and self-echoic behavior because it permits continued exposure to the critical verbal stimulus (X) during the delay resulting from a prolonged search. Any object that evokes the same response that is being made self-echoically is then the correct object at which to point. (This is the process described by Lowenkron, 1991, 1992, as *joint control*.) Now, with this more sophisticated locating repertoire in effect, the child is told "this is X" and then is asked "what is this?" in a typical tact training procedure. When a child who can effectively tact the object that is indicated is asked "where's X?" she has only to make an echoic and subsequent self-echoic responses until the visual search results in a stimulus that evokes as a tact the same response that is being made self-echoically.

Horne and Lowe might say that my use of separate repertoires is simply elaborating the implications of the naming concept. However, until the function of the separate repertoires is understood in each instance of verbal behavior, any reference to naming is incomplete, and once they are understood it is not clear what is added by reference to naming. There may be a negative contribution, however, in that an unanalyzed naming concept may seem to render unnecessary the more detailed analysis, much as happens with some uses of *rule-governed behavior* and *equivalence*.

In *Verbal Behavior*, Skinner (1957, pp. 187–198) contrasts his verbal operant as a unit of analysis with the more traditional *word and its meaning*. Naming as the basic unit of verbal behavior seems to be a sanitized version of the *word and its meaning*. I think I favor abandoning that type of explanation in favor of one based on the various verbal operant repertoires in combination and in interaction with each other.