Promoting Synthesis in the Analysis of Verbal Relations

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In considering future directions for a particular area of study within behavior analysis, it is necessary to first define the area. Potential defining features include the subject matter of interest, the terminological and conceptual framework employed, the literature typically referenced, and the issues (i.e., research and theoretical questions) of particular importance to workers in the area. All of these features need not be included in the definition of an area; the fewer cited as relevant, the broader the area of study. For instance, an area defined solely by its subject matter might include work that is controlled by diverse conceptual frameworks, appears in various literatures, and addresses a wide range of important issues. This would be a relatively broad area. Such an area might include a number of more narrowly defined specialty areas.

The analysis of verbal relations appears to be an area defined by its subject matter: the behavior-environment relations of an individual speaker or listener. Within this broad area, Michael (1984) discussed three major specialty areas: the operant conditioning of adult verbal behavior, research on establishing more effective speaker or listener repertoires (i.e., applied language research), and research and interpretation directly related to Skinner's (1957) book *Verbal Behavior*. Additional areas addressed by Michael include the work of Kurt Salzinger, research on teaching language to apes and other nonhuman animals, and human operant research related

to rule-governed behavior. At present, it appears that three specialty areas may be added: stimulus equivalence research (Sidman, 1994; Sidman & Tailby, 1982), direct instruction theory and application (Engelmann & Carnine, 1982), and relational frame theory (Hayes, 1991, 1994).

Given the diversity of the area, there may be two approaches to suggesting future directions for the analysis of verbal relations. One is to consider individual specialty areas and suggest future directions within each area. For instance, one set of future directions might be suggested for research and interpretation directly related to Skinner's *Verbal Behavior* (1957), and a separate set might be suggested for stimulus equivalence research. A second option is to consider several specialty areas simultaneously and suggest more general future directions that are applicable to all of the areas. This paper will pursue the second approach.

Specifically, this paper will argue that an important direction for the analysis of verbal relations is a synthesis of different specialty areas that study the same behavioral events. It appears that certain benefits may accrue from translating among conceptual frameworks and integrating research findings (where applicable) from the different specialty areas. Such interdependence may yield a more comprehensive view of the overall subject matter and reduce unnecessary duplication of effort by workers in different areas. Research findings and conceptual analyses from each of the areas may be applied to the others, yielding new experimental questions and approaches to conducting research. Apparent contradictions in research findings and conceptual analyses between areas also may serve as

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motivative variables or establishing operations (Michael, 1982, 1993) for work that will yield more general conceptualizations of the phenomena of interest. In addition to integrating work from different specialty areas, translating nonbehavioral work into behavioral terms may also be useful in some instances.

Examples of synthesis have begun to appear in the literatures of verbal relations. For instance, in their reviews of interventions to teach manding, Hall and Sundberg (1987), Brady, Saunders, and Spradlin (1994-1995), and Shafer (1994-1995) have integrated research findings and conceptual analyses from applied language research (often published in the *Journal of Applied Behavior Analysis*) and work directly related to Skinner (1957) (often published in *The Analysis of Verbal Behavior*). Alessi (1987) summarized strategies for generating abstract verbal relations or emergent performances (i.e., behaviors that occur without direct training), integrating analyses and findings from direct instruction (cf. Engelmann & Carnine, 1982) and work related to *Verbal Behavior*. Hall and Chase (1991) discussed the extent to which the subject matter of stimulus equivalence seems to overlap with that of *Verbal Behavior*. Hayes (1991, 1994) described stimulus equivalence according to relational frame theory, as a special instance of arbitrarily applicable relational responding.

Another type of synthesis has involved translating work conducted outside the field of behavior analysis into behavioral terms. Savage-Rumbaugh (1984) reinterpreted cognitive language research with chimpanzees using the conceptual model of *Verbal Behavior* (1957). It was found that findings from the ape language research supported Skinner's distinction between mands and tacts. Salzinger (1991) analyzed an example of cognitive research from a behavioral point of view and argued that cognitive work on thinking, problem solving, and language has relevance for behavior analysts. Place (1991) described points of similarity between conversation analysis in sociology and behavior analysis, and illustrated how terms and concepts from conversation analysis may contribute to a functional account of ongoing verbal relations. Hall (1992) analyzed terms and concepts from Tannen's (1986, 1990)

linguistic analyses of conversational style in terms of *Verbal Behavior*. Hall (1993) provided a behavioral explanation of facilitated communication by integrating Skinner's analysis of automatic verbal behavior with descriptions of ouija, automatic writing, and channeling found in occult and metaphysical writings. Shimamune and Malott (1994-1995) provided a behavioral account of complex concept learning procedures that had previously been described in cognitive terms.

In conducting this type of translation, it is important to note that the nonbehavioral work to be translated must be of a certain type: It should specify the actual behavior of individual organisms in relation to environmental events. For instance, Savage-Rumbaugh's (1984) ape language research was inspired by the cognitive model. However, the actual behavior of the individual chimpanzees and the training procedures used were clearly specified. With these specifications, it was possible to describe functional behavior-environment relations and discuss the research in terms of Skinner's (1957) analysis of verbal behavior. As Vargas (1991) has pointed out, however, cognitive research may not always be amenable to behavioral translation, due to differences in assumptions, research design, and types of data collected between the two fields of study. It therefore seems critical to target the right kinds of nonbehavioral work when attempting behavioral translations.

Although examples of synthesis can be found, a more complete integration of specialty areas within the analysis of verbal relations appears to be needed. Most syntheses have involved two specialty areas, yet more than two areas may focus on the same behavioral events. To achieve a comprehensive description of the subject matter, it seems necessary to translate among the different conceptual frameworks and incorporate analyses and findings from all of the overlapping specialty areas. In conducting this translation, it seems necessary to employ a consistent terminological and conceptual framework, one that is sufficiently precise, complex, and sophisticated to capture the functional distinctions inherent in verbal relations and promotes behavioral rather

than psycholinguistic views of the subject matter. Skinner's (1957) analysis of verbal behavior appears to meet these criteria. It is conceivable that Skinner's analysis will need to be refined, revised, or expanded to incorporate the analyses and findings of the different specialty areas. Regardless of any adjustments that may be needed, Skinner's functional approach is appropriate to the subject matter of verbal relations. In contrast, the language of the common culture includes problematic terms such as *language* and the *use of language* (cf. Lee, 1981). According to Lee, such terms are inappropriate in behavior analysis because they perpetuate the "psycholinguistic concept of language as a nonbehavioral entity that people use both to speak and to comprehend speech. ... Investigators find themselves thinking of the vocal and non-vocal responses simultaneously, as manifestations of some underlying process of 'understanding the language'" (pp. 32-33). Continuing to describe verbal events in terms of the language of the common culture appears to be an impediment to progress in the analysis of verbal relations.

Finally, in promoting greater interdependence of specialty areas within the analysis of verbal relations, it is necessary to select the phenomena to be analyzed. It appears that any subset of the verbal subject matter that is studied by more than one area (or that is addressed in a potentially useful way by workers outside the field of behavior analysis) may be selected. For maximum impact, a selected phenomenon might be one that has inspired provocative research or conceptual questions in a number of specialty areas.

One subset of verbal relations that has generated considerable interest in different specialty areas is the phenomenon of abstract verbal relations. It appears that a comprehensive description of this subject matter that incorporates work from all of the relevant specialty areas could make a major contribution to the analysis of verbal relations. Conducting such an analysis is beyond the scope of this paper. Nevertheless, a brief definition and description of abstract verbal relations may suggest the extent of the overlap among areas and strengthen the case for integrating work relevant to this subject matter.

In *Verbal Behavior*, Skinner (1957) discussed the topic of abstraction in sections describing abstract stimulus control, generic tact extension, manipulative autoclitic frames, and minimal response repertoires. According to Skinner (pp. 107-113), abstraction occurs when one or more properties of stimuli acquire control over responding, and those properties continue to exert control when they occur in novel contexts. Perhaps the most familiar type of abstraction occurs in tact verbal relations. Saying "red" in the presence of a red object is a tact relation. Abstraction is present when saying "red" is controlled only by the property of redness. Then, when novel red stimuli are presented (i.e., the abstract property of redness is presented in novel contexts), a speaker may say "red" without direct training. Although Skinner discussed abstraction primarily in relation to tacting, this process also may occur with the other verbal operants, as noted by Peterson (1978). It also may occur in more complex relations between relations such as a relation among tacts, manipulative autoclitic frames, and tacts (Alessi, 1987).

Workers in other specialty areas have talked about abstract verbal relations in diverse ways. These areas include applied language research, stimulus equivalence research, direct instruction theory, and relational frame theory. Applied language researchers have referred to abstract responding as *generalization*. Stimulus equivalence researchers have used the terms *reflexivity*, *symmetry*, and *transitivity* to describe abstract responding. Workers in the area of direct instruction have used concept-learning terminology to describe abstract responding. According to Engelmann and Carnine (1982, p. 36), "If a set of examples has an observed sameness, that sameness is a concept, the basis for a discrimination or a generalization." Types of concepts described by Engelmann and Carnine include noun concepts, noncomparative concepts, comparative single-dimension concepts, single-transformation concepts, double-transformation concepts, and correlated-features concepts. Relational frame theory substitutes the term *arbitrarily applicable relational responding* for abstract verbal responding. As noted by Hayes (1991, 1994),

stimulus equivalence appears to be a special case of arbitrarily applicable relational responding. As such, it is also a special case of abstract verbal responding (cf. Hall & Chase, 1991). The concepts that define stimulus equivalence also seem to exemplify specific complex concepts described by Engelmann and Carnine.

The different specialty areas have analyzed abstract verbal responding from a variety of perspectives and conceptual frameworks. Such differences may obscure similarities in the subject matters of these areas. It therefore seems important to translate these analyses into a common conceptual framework (i.e., that of Skinner, 1957) and put all of the available pieces together to develop a comprehensive description of the subject matter. This exercise in scientific system building may prove to be a major undertaking and might therefore be approached in small increments. After this synthesis has been accomplished and work from the different areas has been placed in its proper context, it may be possible to suggest additional future directions for the study of abstract verbal responding and for the analysis of verbal relations as a whole.

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