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THE SELECTIVE IMPACT OF SKINNER'S *VERBAL BEHAVIOR* ON EMPIRICAL RESEARCH: A REPLY TO SCHLINGER (2008)

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In a recent article, Schlinger (2008) marked the 50th anniversary of the publication of Skinner's Verbal Behavior *(1957) by considering its impact on the field of behaviorism and research on verbal behavior. In the present article, we comment on Schlinger's conclusions regarding the impact of the book and highlight the extensions and alternatives to Skinner's account proposed by research on stimulus equivalence and derived relational responding. Moreover, we argue that* Verbal Behavior *has had a selective impact on empirical research and that only further basic and applied research will determine whether the next 50 years of behavior-analytic research on verbal behavior will live up to the promise that Skinner envisaged.*
Key words: verbal behavior, empirical research, behavior analysis

In a recent article in this journal, Schlinger (2008) marked the 50th anniversary of the publication of Skinner's *Verbal Behavior* (1957) by considering the broad impact the book has had on behaviorism. According to Schlinger, "Given that the book . . . is selling as well as ever, it might be instructive to look at why it and the discipline that forms its experimental foundation have been so resilient" (p. 329). Schlinger considered a range of sources that he claimed indicated a resurgence of interest in *Verbal Behavior* specifically and behavior analysis more generally.

We commend Schlinger's efforts in undertaking this task and agree that the 50th anniversary of *Verbal Behavior* provides an important milestone to evaluate the current status of the field of behavior analysis and the impact that Skinner's taxonomy has had on research. In the present article, rather than address each of the dimensions suggested by Schlinger as indicative of the overall vitality of the discipline of behavior analysis (2008, pp. 329–333), we wish instead to comment on some of the conclusions reached in his consideration of the impact of the book on verbal behavior research. In doing so, we will focus our comments on the reasons claimed for the "durability of *Verbal Behavior*" (p. 333) and will argue that *Verbal Behavior* has had a selective impact on empirical research.

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Evaluating the Claims

Schlinger (2008) stated that "the value of interpretative accounts like *Verbal Behavior* is ultimately determined . . . by the consistency of the interpretation, its conformity to basic scientific principles, and its ability to generate empirical and practical applications" (p. 331). In what follows, we will evaluate *Verbal Behavior* against these dimensions.

First, let us address the issue of consistency. We agree with Schlinger (2008) that *Verbal Behavior* was an exercise in interpretation: a conceptual analysis of the behavior of humans based on extrapolations from operant research with nonhumans. Such analyses have been a mainstay of behavior-analytic theorizing for decades, driven by the strategic assumption of continuity between humans and nonhumans (Dymond, Roche, & Barnes-Holmes, 2003). When considered solely as an exercise in extrapolation, *Verbal Behavior* is indeed consistent in its interpretation, which, Schlinger claimed, was actually Skinner's chief concern: "The only question for Skinner, then, was whether the interpretation conformed to and was constrained by the principles on which it was based. For most behavior analysts, the answer has been in the affirmative (e.g., Palmer, 2006a)" (Schlinger, 2008, p. 332).

For us, this conclusion overlooks the ongoing debate and controversy from within behavior analysis about the consistency of Skinner's interpretation. No one denies the profound contribution Skinner's *Verbal Behavior* made toward understanding human language, and it is not our intention to suggest otherwise. However, we contend that it is important, in the interest of fairness, to acknowledge the extensions and amendments to Skinner's account of verbal behavior that have emerged in the decades since the book was published. Several authors have, for instance, considered extensions and alternatives to Skinner's definition of verbal behavior that take into account the extensive research literature on derived relational responding (e.g., Barnes-Holmes, Barnes-Holmes, & Cullinan, 2000; Chase & Danforth, 1991; Hayes, 1994; Hayes, Barnes-Holmes, & Roche, 2001; Hayes & Hayes, 1989, 1992; Leigland, 1997, 2007). In addition to these important conceptual advances, behavior analysts have also undertaken productive basic and applied research programs that have contributed empirical support for a synthesis of Skinner's taxonomy with contemporary approaches to verbal behavior (e.g., Barnes-Holmes et al., 2000; Barnes-Holmes & Murphy, 2007; Murphy, Barnes-Holmes, & Barnes-Holmes, 2005; Rehfeldt & Root, 2005; Rosales & Rehfeldt, 2007). We believe that occasions such as the 50th anniversary of *Verbal Behavior* warrant acknowledgment of these developments and the debt of gratitude they owe Skinner's account.

Second, the interpretation presented in *Verbal Behavior* does indeed conform to basic scientific principles, but only with those scientific principles available up to 1957. *Verbal Behavior* is thus consistent with what was known at the time. Since 1957, many authors have highlighted the implications of the burgeoning research literature on stimulus equivalence and derived relational responding for informing contemporary accounts of verbal behavior (e.g., Hayes & Hayes, 1992; Sidman, 1994; Stromer, Mackay, & Stoddard, 1992; Wilkinson & McIlvane, 2001). Indeed, several extensions to Skinner's account have been proposed that incorporate findings from research on derived relational responding. Contemporary syntheses of Skinner's taxonomy with concepts from derived relational responding

(e.g., Barnes-Holmes et al., 2000; Chase & Danforth, 1991) have raised the intriguing empirical question of whether "behavioral principles different from those already discovered in research with nonhumans may be needed to explain complex human behavior, most notably in the experimental analysis of verbal behavior" (Dymond et al., 2003, p. 334). We cannot, at present, evaluate this claim, for the research needed to address it has only just begun. We can, however, clearly agree that it is an empirical issue to ascertain whether or not current behavioral principles such as those proposed by Skinner adequately account for all human verbal behavior. The future promise of accounts based on derived relational responding remains to be seen. Only further research, not interpretation, will tell us whether the principles presented in *Verbal Behavior* require any amendment.

Third, has *Verbal Behavior* generated a sufficient number of empirical and practical applications that one might expect for a book that is now just over 50 years old? Schlinger noted the findings of Dymond, O'Hora, Whelan, and O'Donovan (2006) that showed a "slow but steady increase in the rate of empirical studies citing *Verbal Behavior*" (Schlinger, 2008, p. 333) between 1984 and 2004. There are several reasons, however, why we think that it is going beyond the evidence to suggest that those data demonstrate "a growing body of evidence supporting Skinner's interpretation and taxonomy" (p. 333). First, empirical studies that cited *Verbal Behavior* constituted approximately 20% of total citations; the majority of citations were from nonempirical sources. Second, the "slow but steady increase" that Schlinger mentioned consists of studies from several broad categories such as basic, applied, and observational. Studies from the applied category accounted for the majority of these citations. Third, Dymond et al. (2006) conducted an additional obliteration analysis to identify articles that employed one of Skinner's verbal operants but that did not cite *Verbal Behavior*. A total of 34 empirical articles were identified from the obliteration analysis and a further 67 from citation analysis. Thus, a total of 101 empirical articles, 66% of which actually cited *Verbal Behavior* (and thus can be said to have been directly influenced by it), were identified by Dymond et al. (2006). This translates to an average of 3 articles per year across the 20-year review period.

Finally, a recent analysis by Dixon, Small, and Rosales (2007) of the 101 obliterated and nonobliterated articles identified by Dymond et al. (2006) found that the growth in empirical articles was extremely specialized. Dixon et al. found that 77.7% of the articles reported research conducted with atypical populations, with the majority involving individuals with autism, and concluded:

> The results indicate that the study of verbal behavior has overwhelmingly been conducted with children with developmental disabilities. Although the invaluable clinical significance of this research is not questioned, this alone cannot sustain the reliance on *Verbal Behavior* as a conceptualization of human language. Consequently, there is a need to expand basic research on verbal behavior to typically developing individuals and to more advanced forms of language. (Dixon et al., 2007, p. 204)

We agree with Schlinger, and indeed the findings from the citation analyses of Dymond et al. (2006) and Dixon et al. (2007) are supportive of

the fact, that *Verbal Behavior* has had a "substantial influence on academic writing" (2008, p. 334) as indicated by the majority of citations from nonempirical (e.g., review) articles. However, it has not, at least at present, had the intended impact on *empirical* research, particularly with typically developing populations, that Skinner might have hoped for.

Concluding Comments

Before offering some concluding comments, we would like to briefly address two other points raised by Schlinger (2008). First, in early sections of his article considering the broader impact that *Verbal Behavior* may have had on the field of behavior analysis, he rightly casted doubt on reports of the apparent demise of behaviorism following the so-called cognitive revolution, an event seemingly inspired by Chomsky's (1959) review. Overexaggerated reports of the death of behaviorism are the subject of ongoing scholarly debate (e.g., Costall, 2006; Miller, 2003), and it is not our intention to further speculate on this matter. However, it is worth reiterating that it will always be difficult to clearly establish that the publication of a book or a review of a book was responsible for initiating a paradigmatic shift in scientific thinking.

Second, Schlinger (2008) listed a number of journals that both regularly publish work by behavior analysts (e.g., *Behavior Modification*, *Behavioural Processes*, *Learning & Behavior, The Psychological Record*) and are devoted exclusively to theoretical, experimental, and applied behavioral work (e.g., *Journal of Applied Behavior Analysis, Journal of the Experimental Analysis of Behavior, The Behavior Analyst, The Analysis of Verbal Behavior*). While the prominence of these behavioral journals within the broader scientific literature may be readily obtained through consideration of, for instance, citation impact factor (e.g., Carr & Britton, 2003; Carr & Stewart, 2005), it is worth noting that at least one of these journals is not listed in all searchable databases. For instance, *The Analysis of Verbal Behavior* (*TAVB*) is not currently included in the *ISI Web of Knowledge* (http://wok.mimas.ac.uk/) and has only recently become available at *PubMed Central* (http://www.ncbi.nlm.nih.gov/pubmed/). Accordingly, *TAVB* does not yet have an impact factor. This indicates that the perceived impact and prominence of one of the field's leading behavioral journals for research on verbal behavior are likely obscured by difficulties readers might have accessing its articles. It is possible then, that to those outside the field, behavior-analytic research on this important topic may seem to be narrow in focus and published in highly specialized, low-impact, and often difficult-to-access outlets.

In conclusion, we agree with Schlinger's (2008) concluding comments that to dismiss the science of behavior analysis and Skinner's theoretical account of an important subject matter like verbal behavior on the basis of one book review (i.e., Chomsky, 1959) would be absurd. Likewise, it would be equally rash to fail to use the occasion of the 50th anniversary of the publication of *Verbal Behavior* to acknowledge the book's possible limitations, the extensions and amendments that have been proposed, and its current, selective impact on empirical research. Only further basic and applied research, not interpretation, will show whether or not the next 50 years of behavior-analytic research on complex human verbal behavior lives up to the promise that Skinner envisaged.

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