

A LEGACY OF GROWTH: HUMAN OPERANT RESEARCH IN *THE PSYCHOLOGICAL RECORD*, 1980-1999

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Laboratory analyses of human behavior are crucial for evaluating the interspecies generality of operant principles, and *The Psychological Record* provided early leadership in publishing human operant articles. To assess the journal's modern status in this research area, we determined the prevalence of human operant studies in *The Psychological Record* for the years 1980 through 1999. The number of these studies increased consistently across the census period. During the 1990s, the journal published more human operant studies overall, and more studies in 3 of 5 content areas, than the *Journal of the Experimental Analysis of Behavior*, which usually is regarded as the natural home for this type of research. These data indicate that *The Psychological Record* continues to play an important role in the development of a human laboratory tradition in operant psychology.

The operant tradition in psychology began in the animal laboratory (e.g., Skinner, 1938), but Skinner (1953) recognized that "there is no point in furthering a science of nature unless it includes a sizeable science of human nature" (p. 5). Indeed, many psychologists question the assumption of interspecies generality (e.g., Branch & Hackenberg, 1998; Skinner, 1966) that underpins operant research with animals. Thus, the laboratory study of human operant behavior (also known as the Experimental Analysis of Human Behavior, or EAHB) serves as an essential proving ground of operant theory (e.g., Buskist, 1983; Hake, 1982). Despite early attempts to extend operant methods to the study of human behavior (e.g. Lindsley, 1956), however, published reports of EAHB began to appear with regularity only during the last two decades of the 20th century (e.g., Buskist & Miller, 1982a; Dougherty, 1994; Dymond & Critchfield, in press; Hyten & Reilly, 1992).¹

¹These efforts quickly spawned a program of application (e.g., see the *Journal of Applied Behavior Analysis*, beginning in 1968), but applied research, with its primary emphasis on practical solutions rather than fundamental principles, can not circumvent the need for human laboratory science (e.g., Baron, Perone, & Galizio, 1991). In the present case, it may also be relevant that applied behavior analysis has focused heavily on the behavior of persons with developmental disabilities and other atypical features, leaving the general applicability of operant principles to human behavior open to debate.

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At least two factors probably constrained the growth of EAHB. First, investigators faced uncertainty about how to create functional analogues of the procedures that have yielded robust experimental control in animal studies (e.g., Baron & Perone, 1982; Lattal & Perone, 1998). Second, investigators had difficulty identifying publication outlets that could appreciate the single-subject research designs usually employed in EAHB and the unusual topical focus of this evolving research area (e.g., Hake, 1982). In the latter regard, the *Journal of the Experimental Analysis of Behavior (JEAB)* offered encouragement to the fledgling research area (e.g., Nevin, 1982) and is widely regarded as EAHB's natural home (e.g., Buskist & Miller, 1982a). Yet *The Psychological Record (TPR)* also appears to have played a special role in the development of EAHB. Early on, *TPR* published a special issue devoted exclusively to EAHB (Buskist, 1983)—something that *JEAB* would not do for another 17 years (Navarick, Bernstein, & Fantino, 1990)—as well as the area's first topical bibliography (Buskist & Miller, 1982b). One early *TPR* article, Baron and Galizio's (1983) review of instructional control of human operant behavior, has become one of the area's most-cited sources (Critchfield, Buskist, Saville, Crockett, Sherburne, & Keel, 2000).

Casual inspection suggests that *TPR* continues to feature reports of EAHB research, along with related conceptual and review articles, although no formal appraisal of *TPR*'s impact upon EAHB has been published to date except for one brief note describing a growing presence of EAHB articles in *TPR* during the years 1986-1994 (Buskist, Sherburne, & Critchfield, 1996). Otherwise, all surveys of publication trends in the area have focused on *JEAB* (Buskist & Miller, 1982a; Dougherty, 1994; Dymond & Critchfield, in press; Hyten & Reilly, 1992).

The purpose of the present study was to briefly examine the history of EAHB in *TPR* in the form of publication trends for the years 1980 to 1999. This interval was selected because previous surveys of EAHB in *JEAB* indicate that (a) little EAHB research was published before 1980; (b) growth in EAHB was evident during the late 1980s to early 1990s; and (c) EAHB publication rates have not changed systematically since the mid-1990s (e.g., Buskist & Miller, 1982a; Dymond & Critchfield, in press). We determined the number of EAHB articles published annually in *TPR* and categorized those articles according to topical emphasis. By employing the same methods as a previous study of *JEAB* publication trends (Dymond & Critchfield, in press), we were able to compare *TPR* trends with those in the journal for which EAHB is perhaps best known.

Article Classification

Article Selection and Categories

We examined all primary empirical reports involving human subjects published in *TPR* between 1980 and 1999. Review, theoretical, and technical articles were excluded to focus on EAHB articles presenting original data (cf. Buskist et al., 1996). To determine the types of research

questions that EAHB studies in *TPR* have addressed most often, the articles were assigned to content categories (Table 1) derived from those of Buskist and Miller (1982b; see Dymond & Critchfield, in press, for rationale). No attempt was made to create content categories of equal breadth or to avoid subordinate-superordinate relationships among categories. Instead, the categories were intended to mirror traditional areas of emphasis in the operant research tradition. Because research projects can reflect multiple emphases, each research report could be assigned to more than one content categories. For example, an experiment employing concurrent schedules of reinforcement to evaluate assumptions of the matching law might be assigned to both "Reinforcement and Punishment" and "Choice and Preference."

Table 1

Topical Categories into Which Studies of Human Operant Research Articles Were Assigned	
Category	Description
Behavioral Pharmacology	"Behavioral action of drugs" (Branch, 1991, p. 21), including pharmacologically mediated effects on operant behavior, and the role of drugs as reinforcers and as discriminative stimuli
Choice and Preference	"Manipulation of reinforcer frequency, magnitude, or, in general, reinforcer value in concurrent operant procedures" (Buskist & Miller, 1982a, p. 140), including research on self-control
Reinforcement and Punishment	"Parametric investigations of human performance on various schedules of reinforcement" (Buskist & Miller, 1982a, p. 140), including studies examining conditioned reinforcement, reinforcer type, and reinforcement theory; also includes analogous investigations of punishment and conditioned suppression; primary focus on illuminating fundamental principles of operant consequences, rather than applying these principles to shed light on other processes.
Social and Verbal Behavior	Empirical studies of social behaviors such as competition, cooperation, and aggression, and studies which involve "the acquisition and maintenance of conversation and vocalization" (Buskist & Miller, 1982a, p. 140), including research on instructions, self-instructions, rule-governance, and self-report
Stimulus Control	"Studies dealing with the aspects of generalization and discrimination" (Buskist & Miller, 1982a, p. 140), including research on derived stimulus relations; primary focus on illuminating fundamental principles of stimulus control, rather than applying these principles to shed light on other processes

Observer Training, Article Coding, and Reliability Assessment

Observer training took place in two phases. In the first phase of training, two observers independently applied the content categories to EAHB articles in six volumes of *TPR* and compared their ratings on an article-by-article basis. Disagreements about content categories

prompted the recoding of the relevant articles, with results compared as before. Remaining discrepancies were discussed until the observers agreed on category assignments, definitions, and interpretations. In the second phase of training, one observer then applied the training experience to the coding of all relevant *TPR* articles. At least one week later, the observer repeated this evaluation for 30% of targeted *TPR* volumes (we selected the years 1993 to 1999, in which EAHB articles were most common), and intraobserver agreement was assessed by comparing total counts, from the first and second evaluations, for each of the content categories. Across categories, mean percent agreement [$100 \times (\text{lower count}/\text{higher count})$] was 94%, with agreement scores for individual categories ranging from 82% to 100%. Because the first and second evaluations produced similar results, the second one was arbitrarily chosen for use in the final data set.

EAHB Publication Trends

Previous reports have described the number of EAHB articles in *JEAB* as a proportion of that journal's total articles (e.g., Dymond & Critchfield, in press; Hyten & Reilly, 1992). That approach was deemed inappropriate for the present analysis, which focused on a more eclectic journal, and sought instead to assess raw prevalence of EAHB studies. Within a given journal, the number of articles of any type can be influenced by a variety of structural factors (number of issues published annually, number of pages published per issue, number of pages per published article, etc.). Nevertheless, a simple count of articles published provides a useful estimate of the volume of work in a journal.

Figure 1 shows the number of EAHB articles published each year in *TPR* from 1980 to 1999, compared to the number published in *JEAB*, as reported previously by Dymond and Critchfield (in press). The number of EAHB articles published per year in *JEAB* increased from throughout the 1980s and

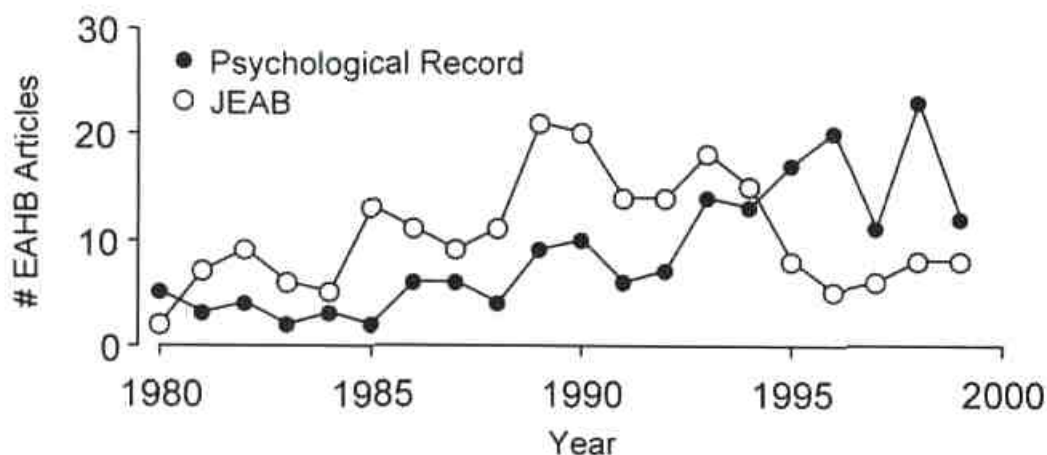


Figure 1. Number of articles addressing human operant behavior published in *The Psychological Record* (*TPR*) and the *Journal of the Experimental analysis of Behavior* (*JEAB*) from 1980 to 1999.

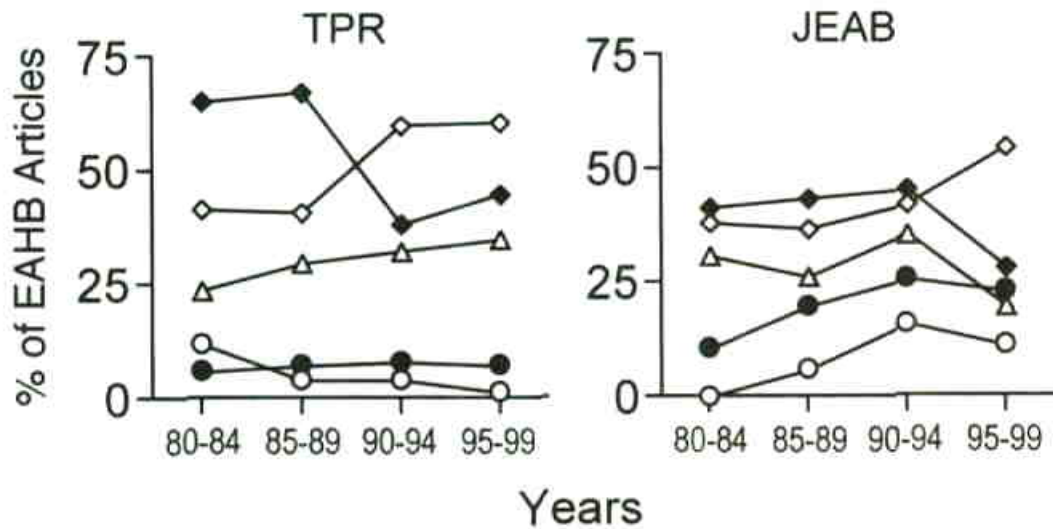
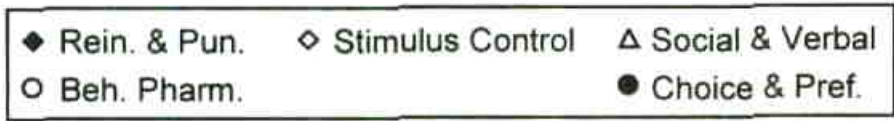
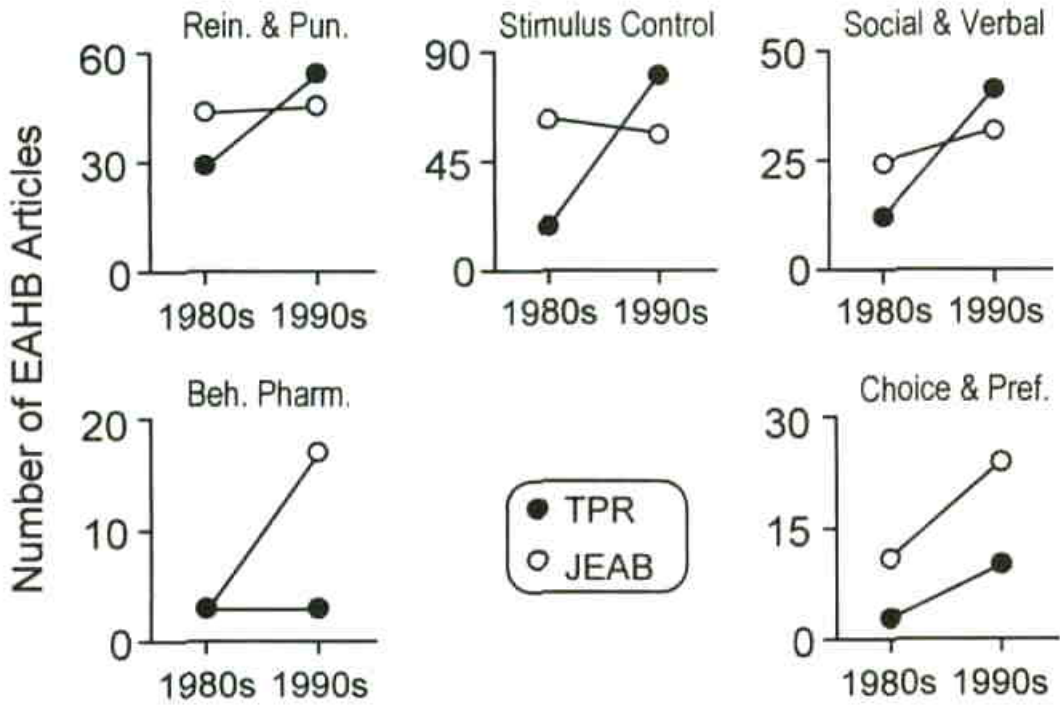


Figure 2. Number of articles addressing five topic areas in human operant behavior published in *The Psychological Record* (TPR) and the *Journal of the Experimental Analysis of Behavior* (JEAB). Top: Journals compared across two decades. Bottom: Within-journal patterns across five-year intervals.

decreased thereafter before leveling off in the late 1990s. By contrast, the number of EAHB articles per year in *TPR* has increased steadily since the mid-1980s and the trend shows no obvious sign of abating. Figure 1 verifies that, as suggested by Buskist et al. (1996), more EAHB articles now appear annually in *TPR* than in the journal that spawned EAHB originally.

The top panels of Figure 2 show the number of articles that addressed each of the five content categories. During the 1980s, *JEAB* published more articles in 4 of 5 categories. During the 1990s, *TPR* published more articles on Reinforcement and Punishment, Stimulus Control, and Social and Verbal Behavior, while *JEAB* published more articles on Behavioral Pharmacology and Choice and Preference. The bottom panels of Figure 2 show the *percentage* of each journal's EAHB articles that addressed each of the five content categories. In relative terms, both journals have seen a decrease in emphasis on Reinforcement and Punishment, accompanied by increasing emphasis on Stimulus Control. EAHB research addressing topics in Social and Verbal Behavior has been gradually increasing in prevalence in *TPR*, and apparently decreasing in prevalence in *JEAB*. Research on Behavioral Pharmacology and Choice and Preference has been increasing in prevalence in *JEAB*, while remaining rare in *TPR*.

Conclusions

The present data show that, consistent with *TPR*'s early leadership role in showcasing EAHB, the journal has become a prominent source of primary empirical reports featuring the analysis of human operant behavior. In terms of raw publication counts, it may well rank as *the* prominent source, outpacing *JEAB* in 3 of 5 content areas during the 1990s. As the number of EAHB articles in *TPR* has grown, so too, perhaps, has its influence in this research area. A recent citation analysis showed that 7 *TPR* articles (including 6 primary empirical reports) were among the 98 sources most often cited in EAHB research during the 1990s (Critchfield et al., 2000). These data probably underestimate the journal's current influence, because EAHB has expanded noticeably in *TPR* only in recent years, and citations lag behind publication dates. It may be telling therefore that, although more than two thirds of the most-cited sources of the 1990s date to the 1980s or earlier, 4 of the 6 most-cited primary empirical reports from *TPR* were published in the early 1990s.

In examining EAHB publication trends outside of the pages of *JEAB*, the present investigation raises obvious questions about the relationship between journals in supporting EAHB research. One possibility is that journals compete for a limited pool of EAHB studies, but a simple linear regression involving *JEAB* and *TPR* annual article counts from our survey revealed no systematic relationship between the two ($R = .04$). The increasing prevalence of EAHB in journals other than *JEAB* could suggest growth in the area overall. At least four journals² now publish

² These journals include *TPR*, *JEAB*, *The Analysis of Verbal Behavior*, and the on-line *Experimental Analysis of Human Behavior Bulletin* (<http://www.eahb.org>).

EAHB primary empirical reports on some regular basis (e.g., see Critchfield et al., 2000), and relevant work also can be found occasionally in journals focused on developmental disabilities (e.g., Sidman, Willson-Morris, & Kirk, 1986), psychopharmacology (e.g., DeGrandpre & Bickel, 1995), and other specialized enterprises. Figure 2 supports the view that, especially since 1990, *TPR* and *JEAB* have been developing distinct identities with respect to EAHB. *JEAB* authors have placed greater relative emphasis on physiological factors (Behavioral Pharmacology) and quantitative analyses (Choice and Preference), while *TPR* authors have placed greater relative emphasis on interpersonal (Social and Verbal Behavior) and contextual (Stimulus Control) variables. In the latter case, it is worth noting that 5 of the 6 most-cited *TPR* primary empirical articles during the 1990s addressed issues related to stimulus equivalence (Critchfield et al., 2000). *TPR* also has published the only special issue of any basic-science journal devoted to stimulus equivalence (Fields, 1993).

Whatever the relationship between *TPR* and other journals, two things are clear: (1) Operant theory has provided one of the more influential, and controversial, perspectives in modern psychology; and (2) as Skinner (1953) suggested, EAHB plays an important role in evaluating *the generality and viability of operant principles*. Many decades after the first breakthroughs in the animal operant laboratory, EAHB seems to be maturing to fill the role prescribed to it (e.g., Hyten & Reilly, 1992). The present data make clear that *TPR* has had a strong influence on the area's development.

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